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The 1959 California Legislature asked the Liaison Committee of the State Board of Education and the Regents of the University of California to prepare a master plan for the development, expansion, and integration of the facilities, curriculum, and standards of higher education in the junior colleges, state colleges, the University of California, and other institutions of higher education of the State, to meet the needs of the State during the next 10 years and thereafter.

This report on institutional capacities and area needs was made by one of the six technical committees set up as a result of this request. Data were gathered from 148 colleges and universities in California, mostly by means of questionnaires. In addition, information was also obtained from 124 institutions of higher education throughout the United States.

The report is presented under five sections: (1) Nature, purpose, and scope of study, (2) institutional capacities: student capacities of physical plants, (3) utilization of physical plants, (4) enrollment projections and needs for public junior colleges, State colleges, and campuses of the University of California, and (5) faculty demand and supply. The appendixes discuss possible new State colleges and the probable effects of such colleges upon existing ones. Also included are reports of actions taken on the recommendations presented by the committee.

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INSTITUTIONAL CAPACITIES AND AREA NEEDS OF CALIFORNIA PUBLIC HIGHER EDUCATION 1960—1975

8124

Prepared for the Liaison Committee of
The Regents of the University of California
and the State Board of Education
and for the Master Plan Survey Team

By the
TECHNICAL COMMITTEE ON
INSTITUTIONAL CAPACITIES
AND AREA NEEDS

BERKELEY AND SACRAMENTO
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Institutional Capacities and Area Needs of California Public Higher Education 1960–1975

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1960—1975

Prepared for the Liaison Committee of The Regents of the University of California and the State Board of Education and for the Master Plan Survey Team

By the
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THE TECHNICAL COMMITTEE ON INSTITUTIONAL CAPACITIES AND AREA NEEDS

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December 31, 1959

Dr. Arthur G. Coons
Chairman, Master Plan Survey Team, and
President, Occidental College
1600 Campus Road
Los Angeles 41, California

Dear Dr. Coons:

In accordance with the action of the Liaison Committee of the State Board of Education and The Regents of the University of California on July 8, 1959, in approving the appointment of a representative committee to study institutional capacities and area needs of higher education in California to 1975 and your subsequent letter outlining the scope of the Committee's responsibility, we have prepared and now transmit our final report entitled, "Institutional Capacities and Area Needs of California Public Higher Education: 1960–1975." In the preparation of this report we have endeavored to follow the suggestions on format, organization, headings, length of report, and the like, as contained in the August 17, September 18, and December 1 memoranda from your office.

The Committee wishes to express its appreciation to the President of the University of California and to the State Superintendent of Public Instruction for supplying the Committee with a competent staff, and to each member of the staff. Appreciation is also expressed to the college and university administrators, placement officers, and to all others who assisted in any way in making this study.

Very cordially yours,

LLOYD N. MORRISETT, *Chairman*
Technical Committee on Institutional
Capacities and Area Needs

Charles S. Casassa, S.J.
T. Stanley Warburton
Francis J. Flynn

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Section I

NATURE, PURPOSE, AND SCOPE OF THE STUDY

The 1959 Legislature passed Assembly Concurrent Resolution 88, which requested that the Liaison Committee of the State Board of Education and The Regents of the University of California

> . . . prepare a Master Plan for the development, expansion, and integration of the facilities, curriculum, and standards of higher education in the junior colleges, state colleges, the University of California, and other institutions of higher education of the State, to meet the needs of the State during the next 10 years and thereafter.

A review of some earlier studies of higher education in California, some of the circumstances that brought about the above resolution and the organization for the Master Plan study and its general content, are discussed at some length in Chapter II of the summary report entitled, *A Master Plan for Higher Education in California, 1960–1975.* Suffice it to say here that the Master Plan Survey Team, created by the Liaison Committee to develop the Master Plan, set up six technical committees to carry on detailed studies of these areas:

1. Enrollment projections.
2. Selection and retention of students.
3. California's ability to finance higher education.
4. Costs of public higher education in California.
5. Adult education.
6. Institutional capacities and area needs.

This report of the Technical Committee on Institutional Capacities and Area Needs is concerned with present enrollment capacities of the colleges and universities within California, the capacities of these institutions when currently funded expansion is completed, and the need for additional capacity and faculty to accommodate the projected college enrollment in 1975.

Plan and Scope of This Study

In order to estimate the needs of California and of the several economic areas within the state for additional capacity and faculty to accommodate the projected college enrollment in 1975 in the junior colleges, the state colleges, the University of California, and the independent colleges and universities, the Technical Committee on Institutional Capacities and Area Needs has attempted:

1. To determine the enrollment capacities of the colleges and universities of the state as of the fall of 1958 and as of the completion of authorized funded expansion.

2. To utilize relevant projections furnished by the State Department of Finance as basic data for analyzing projections of graduate degrees in 1975, as supplied by the colleges and universities.

3. In determining physical plant needs to utilize the breakdown of these enrollment projections by lower division, upper division, and graduate division, and, further, by enrollments in junior colleges, state colleges, the University of California, and independent colleges and universities.

4. To determine the estimated number of students in higher education in 1975 in excess of present and immediate capacities of the colleges and universities in the state.

5. To break down this estimated number of students in 1975 according to lower division, upper division, and graduate division enrollments, and in terms of needed expansion of junior colleges, state colleges, the University of California, and independent colleges and universities.

6. To set forth estimates of minimum, optimum, and maximum sizes (in terms of enrollments) for a junior college, a state college, and a campus of the University of California.

7. On the basis of the foregoing to point up the higher education needs of the several economic areas of the state, with priorities, for new junior colleges, state colleges, and campuses of the University of California.

8. To assess the current utilization of physical plants and to suggest ways and means of improving the utilization of physical facilities to effect economies without decreasing the effectiveness of the educational research and service programs of the institutions.

9. To determine the demand for and supply of college and university teachers and to project this to 1975, and, further, to distribute the demand and supply in terms of junior colleges, state colleges, the University of California, and independent colleges and universities.

Assumptions

This is necessarily a *status quo* study and is based on the assumption that major policies now in effect and controlling higher education in California will remain unchanged. These include:

1. Policies established at the state level by the Executive Department, the State Legislature, the State Department of Education, the State Board of Education, and The Regents of the University of California.
2. Policies of independent colleges and universities and of local junior colleges.

The projections and estimates of needs are based on the fundamental assumption that conditions in 1959 will continue. Factors that affect projections and estimates are:

1. Nature and rate of population change.
2. Differentiation of functions among the publicly supported segments of higher education in California.
3. Admission requirements and retention policies in institutions of higher education.
4. Number and distribution of new junior colleges established.
5. Number and distribution of new state college campuses.
6. Number and distribution of new campuses of the University of California.
7. Policies and expansion of independent colleges and universities.
8. Tuition and fees charged by colleges and universities.
9. The state of the economy of California and the nation.
10. The state of world affairs and international relations.

Major changes in these factors would undoubtedly alter the projections and the estimates of this report.

How the Study Was Made

The 148 colleges and universities included in this study are those listed as "Institutions of Higher Education in California" in the U. S. Office of Education Directory, *Part 3, Higher Education, 1958–59.* These included seventy junior colleges (sixty-three public and seven private) and technical institutes, offering at least two years, but less than four years, of college-level studies beyond the twelfth grade; twenty-five colleges and universities offering the bachelor's degree only and/or first professional degree; and forty-four colleges and universities offering the master's and/or second professional degree. This latter group included institutions offering the customary first graduate degree and any degree earned in the same field after the first professional degree or after a bachelor's degree in the same field. Also among these institutions were nine colleges and universities granting the doctor of philosophy or equivalent degree. Table 1 shows the distribution of the 148 institutions according to level of offering.

Table 1

Distribution of Institutions of Higher Education in California According to Highest Level of Educational Program Offered

Level of Offering	Number of Institutions
I (Terminal)	70
II (Bachelor's)	25
III (Master's)	44
IV (Doctorate)	9[1]
Total	148

[1] All campuses of the University of California are counted together as one institution.

Table 2

Distribution and Return of Questionnaires on Institutional Capacities

Recipient	Number Sent	Number Returned	Per Cent
Junior Colleges	70	68	97
State Colleges	13	13	100
University of California (one per campus)	7	7	100
Independent Colleges and Universities	64	54	84
Placement Officers	124	89	72
Totals	278	231	83

For the purposes of this study the colleges and universities are treated consistently as:

1. Junior colleges.
2. State colleges.
3. Campuses of the University of California.
4. Independent colleges and universities.

Information for the study was obtained from the 148 colleges and universities in California, supplemented by information from 124 institutions of higher education throughout the United States. The data were gathered largely by questionnaires, the distribution and return of which are shown in Table 2.

In addition, much valuable information was received from the California Junior College Association, and from faculty members of the state colleges, the University of California, and independent colleges and universities. Other contributions were made by the State Department of Education, the State Department of Finance, the University of California, and the Research Division of the National Education Association.

By necessity, the present study was made hurriedly, in a minimum of time. In making it, previously published studies, primarily *A Restudy of the Needs of California in Higher Education,*[1] *A Study of the Need for Additional Centers of Public Higher Education in California,*[2] and *A Study of Faculty Demand and Supply in California, 1957–1970,*[3] were accepted as basic to the purpose of this study and in part were brought up to date and projected to 1975.

---

[1] T. R. McConnell, T. C. Holy, and H. H. Semans, *A Restudy of the Needs of California in Higher Education.* Sacramento, State Department of Education, 1955.

[2] H. H. Semans and T. C. Holy, *A Study of the Need for Additional Centers of Public Higher Education in California.* Sacramento, State Department of Education, 1957.

[3] Joint Staff for the Liaison Committee, *A Study of Faculty Demand and Supply in California, 1957–1970.* Berkeley, University of California, 1958.

Section II

INSTITUTIONAL CAPACITIES: STUDENT CAPACITIES OF PHYSICAL PLANTS

The purpose of this section is to present an inventory of the capacities for students in existing colleges and universities in the state so that the need for new physical facilities can be judged.

In *A Restudy of the Needs of California in Higher Education* (1955) the study of institutional capacities was made largely by a detailed analysis of the square feet of floor space in the institutions' physical plants, with notations on their (then) present use and recommendations for their future use. For example, Table 28 gave "The Distribution of Full-time-equivalent Students by Department and Services Together with the Net Square Feet of Floor Space for Each Student, Fall of 1953."[1] Because the calculation of institutional capacities in terms of square feet is an involved and time-consuming process, and because the present study was done under severe restrictions of time, it became necessary to use a simpler approach. Each institution was asked to report the number of students its physical plant could accommodate.

Delimitation of the Study

Basically, this study sought three items of information concerning the physical plants of the state's colleges and universities. Each of these questions is concerned with the institutions' capacities as of the time of completion of "assured construction"—that is, construction for which financing is *certain*. The three specific items are:

1. The number of students by divisional levels who can be accommodated.
2. The amount of assured capacity that will be in temporary buildings.

---

[1] McConnell, Holy, and Semans, *op. cit.*, pp. 316–317.

3. The seating capacities of the libraries—crucial buildings in any institution's educational program.

To be sure, the extra increment of capacity that will result from presently funded construction is not now in existence. Nonetheless, it is on this capacity that the state may depend: it is the logical place to draw the base line from which future planning is to proceed. This means, then, that filling the gap between this base line and the 1975 need for facilities must be accomplished with money not now in sight.

The emphasis is on the full-time student (one taking twelve or more units of work) rather than on the full-time-equivalent (a combination of full-time and part-time students). The institutional capacities reported in this section are for full-time students, and they are matched, in Table 5 on page 13, against the projected enrollment of full-time students in 1975. It is assumed that part-time students will continue to be accommodated in the colleges and universities in the state at the same ratio to full-time students as they have been in the past.

Each institution was asked to give its student capacity in terms of its own educational programs, policies, and plans. The student capacities reported in this section for the state colleges and the University of California take into account only instructional space, whereas the capacities of the junior colleges and the independent colleges and universities were reported by each institution in terms of its own definitions and standards.

Sources of Data

The data on capacity of institutional physical plants were supplied by the administration of each responding junior college, the State Department of Education for the state colleges, the Statewide Office of Architects and Engineers for the University of California, and the administration of each responding independent college and university. This information was gathered by a series of questionnaires, and the capacities of the public junior colleges were confirmed by telephone calls to each of these institutions. Enrollment projections in Table 5 were developed by the State Department of Finance.

Institutional Capacities Defined

As already noted, all colleges and universities in the study were asked for their student capacities as of the completion of presently assured construction. The term "presently assured construction" was defined in two ways:

1. For the state colleges and the University of California, it was specifically termed "funded expansion," and was defined to include *any* project which has been provided funds for working drawings or for any stage beyond in the funding process.

2. Financing the capital outlay programs of the junior colleges and the independent institutions is, of course, somewhat more involved, since the money comes from a variety of sources. For these institutions, "assured construction" includes that for which financial provision has been made.

Computing the student capacity of a college or university is not as simple as it first seems, for students in different fields of study and at different levels (lower division, upper division, or graduate division) often require different amounts of space. The graduate student generally requires more space than does the undergraduate; laboratory instruction requires more space per student than does non-laboratory instruction. Hence, if an institution is to concentrate on graduate studies, its physical plant will accommodate fewer students than if it concentrates on undergraduate work; if its focus is on fields requiring laboratory instruction, its physical plant will permit the admission of fewer students than if it concentrates on non-laboratory studies. Thus the computation of an institution's student capacity normally proceeds from important decisions concerning its educational policy.

This point is particularly important in considering student capacities of the independent institutions that have the prerogative of selecting their own missions. But, it is also important in considering the capacities of the public institutions that are generally obliged to accept qualified applicants regardless of their level or prospective field of study, for in such a case the prediction of future capacity also involves forecasting of levels of students and fields of study that the institution will be called on to teach in the future.

Because of these complexities it was believed wise to ask for the capacity of an institution in *terms of that institution's educational program, policies, and plans.* This would have been necessary in any case with the independent institutions, where the imposition of external assumptions concerning educational policy is neither possible nor desirable. These colleges and universities will, and must, determine their educational programs and policies in light of their own emphases and the public needs as they interpret them.

Table 3 shows, for each segment of higher education in the state, the student capacity after completion of assured construction, and the per cent of increase which each figure represents over the fall 1958 capacity.

In order to confirm, and to modify where required, the capacities of the public junior colleges obtained by use of the questionnaires, telephone calls were made to the administrative officers who had responded to the questionnaire. They were asked the following questions:

1. In completing the questionnaire for the survey of institutional capacities did you give the capacity of your junior college *after funded expansion is completed* in terms of full-time students from 8:00 a.m. to 5:00 p.m.?

Table 3

Institutional Capacities After Completion of Assured Construction and Per Cent Increase Over Fall 1958 Capacities

Segment	Capacity As of Completion of Assured Construction	Per Cent Increase Over Fall 1958
Junior Colleges	170,020	25.9
State Colleges	68,483[1]	58.9
University of California	51,500	50.8
Independent Colleges and Universities	71,426	18.3
State Total	361,429	32.6

[1] This figure includes California Maritime Academy and a capacity of 500 students each for Alameda and Orange County State Colleges.

2. If you did not, what do you estimate the *full-time student capacity* of your institution will be in terms of full-time students from 8:00 a.m. to 5:00 p.m. when present actual funded expansion is completed?

At the same time it was restated that funded expansion means physical facilities for the junior college for which bonds have been voted or monies appropriated by the governing board. Thus, the estimates of the capacities of the public junior colleges of California given in this report are the estimates of the several administrators of the junior colleges as given in September 1959 and reaffirmed in December 1959.

The "limited students" (those taking six units or less) are excluded from the state colleges' load (the University reports only a few of these) in determining building needs on the assumption that facilities built for the "regular students" (those taking more than six units of work) will also suffice for instruction of the limited students, many of whom attend night classes.

The reported capacity figures for campuses of the state colleges and the University of California are "standard" capacities, based on standards used by each system in planning space needs. These figures do not mean that no more students could be accommodated on these campuses, but that each system regards the numbers given as optimum and that accommodation of more would lead to overcrowding and consequent diminution of educational value.

Capacity in Temporary Facilities

For purposes of this study a *permanent* building was defined as one to be retained according to the long-range physical master plan of the institution, whereas a *temporary* one was defined as one *not* to be retained according to that plan. The "long-range physical master plan" is not limited, in this case, to changes for which money is "in sight," but rather indicates the institution's plan for changes when the money becomes available. A wooden structure is permanent, according to this definition, if there is no plan to remove it; a brick building is temporary if there is a plan to remove it. Table 4 shows the percentages of student capacities which, at the time of completion of assured construction, will be in buildings that the institutions plan eventually to remove from service.

Table 4
Per Cent of Instructional Space in Temporary Buildings
After Completion of Assured Construction

Segment	Per Cent in Temporary Buildings
Junior Colleges	14.2
State Colleges	3.2
University of California	22.0
Independent Colleges and Universities	6.6
State Total	11.7

As shown, at the time of completion of assured construction 11.7 per cent of the student capacity in California colleges and universities—or a total capacity of more than 42,000 students—will be in buildings that the institutions plan to remove from instructional service. It seems reasonable to assume that a sizeable portion of this capacity will have been removed by 1975, thereby increasing by the amount removed the "gap" between institutional capacities and 1975 enrollment needs.

Capacity of Library Facilities

Information was gathered on the capacities of institutional libraries as of completion of assured construction, and the "library student capacity" was computed as a per cent of each institution's capacity. Standards for library seating capacities recommended by the American Library Association vary according to conditions. For junior colleges the recommendation is for a seating capacity of 10 to 25 per cent of enrollment, except for colleges with dormitory facilities, where 20 to 35 per cent of enrollment is recommended. No indication is given, however, of how these figures would be affected by different percentages of enrollment housed in dormitories.

For college and university libraries, the American Library Association merely says that accommodations for at least one-third of the student body are essential. No mention is made in this case of the presence of residence halls on the campus. The Association does indicate that new library construction should be based on an anticipated growth over a twenty-year period.

Of the sixty public junior colleges from which information was obtained, thirty-five, or 58 per cent, will have, after completion of assured construction, at least 10 per cent as many library study stations as capacity for full-time students. Five of the thirteen state colleges and four of the five University of California campuses will have at least one-third as many library study stations as capacity for full-time students. These figures are all within the American Library Association's minimum standards.

Relationship Between Capacity and Projected Enrollment

Table 5 contrasts the student capacities that will exist in the colleges and universities in California at the time of completion of assured construction with the projected 1975 enrollment needs. It compares assured construction capacity and 1975 enrollment needs for each segment of higher education by divisional level and for all divisions, and gives a total figure for all segments of higher education, again by divisional level and a total for all divisions. The figures that sum up the total state picture for *all* segments of higher education and *all* divisional levels are in the lower right corner of Table 5. These figures show that at the time of completion of assured construction (the bulk of which will be completed in 1962) there will be capacity for some 361,000 students in all the state's colleges and universities. By 1975, according to data developed by the State Department of Finance, the total full-time student enrollment will be 648,650, leaving a difference between 1975 need and assured construction capacity of some 287,000 students who must be provided for in the state's college and university physical plants. This figure represents a need of 79.5 per cent over and above the capacities that will be available when assured construction is complete. It is estimated that it will cost the state $66,824,640 to complete the assured construction in the state colleges and the University of California.

The minus sign in a "difference" figure indicates an excess of assured construction capacity over projected 1975 enrollment. In Table 5 there is such an excess in prospect for the independent colleges and universities at the upper- and graduate-division levels, and in the total figure. The difference figure at the upper divisional level is a rather small one, showing an excess capacity for some 700 students more than the projected enrollment. The figure at the graduate level is considerably larger, showing a capacity-over-enrollment excess of nearly 4,000. The total figure is small: 226 excess of capacity over enrollment.

Concerning the excess of capacity over projected enrollment in the independent institutions, it should be pointed out that although the enrollments of the three segments of public higher education were projected without considering the capacities of these institutions, the projections for the independent institutions were made by officials of each school who also reported funded capacity figures. The closeness of the funded capacity and projected enrollment figures for the independent institutions suggests that in making projections for 1975 these officials were influenced by the numbers of students they know they will be able to house. Specifically, it suggests a reluctance to record plans for 1975 unless the construction required to handle greater numbers of students is assured. If this is the case, then greater numbers of students might be accommodated by the independent institutions as more construction is financed beyond that which is now assured.

Still another possible explanation for this excess is that the independent colleges and universities in the state include many that are small and intend to remain small. The small liberal arts college is usually devoted to the idea of smallness, believing that its unique mission is best accomplished by limiting its enrollment. There are doubtless many independent institutions in the state that have no desire to increase enrollments, except to a limited degree. This phenomenon would tend to make funded capacity and projected enrollment figures similar in size, as they are shown to be for the independent institutions in Table 5.

It is reiterated that this report is based on the assumptions that all major conditions relevant to capacities of physical plants that existed in September 1959 will be present in 1975 and that distribution of enrollment in the public junior colleges, state colleges, the University of California, and independent colleges and universities in 1975 will be the same as in 1959. However, if policies at the state level should change so as to divert 50,000 students from the lower divisions of the state colleges and the University of California to public junior colleges,

Table 5

Statewide Full-Time Student Capacities of California Colleges and Universities After Assured Construction, Contrasted with Projected 1975 Full-Time Enrollments

Segment	Lower Division	Upper Division	Graduate Division	Total
Public Junior Colleges				
Projected 1975 Enrollment	246,350	......	......	246,350[1]
Funded Capacity	170,020	......	......	170,020
Difference	76,330	......	......	76,330
State Colleges				
Projected 1975 Enrollment	91,750	96,300	11,950	200,000
Funded Capacity	29,337	35,538	3,608	68,483
Difference	62,413	60,762	8,342	131,517
University of California				
Projected 1975 Enrollment	45,900	50,450	34,750	131,100[2]
Funded Capacity	18,050	20,650	12,800	51,500[2]
Difference	27,850	29,800	21,950	79,600
Independent Colleges and Universities				
Projected 1975 Enrollment	34,250	25,550	11,400	71,200[3]
Funded Capacity	29,816	26,273	15,337	71,426
Difference	4,434	−723	−3,937	−226
State Totals				
Projected 1975 Enrollment	418,250	172,300	58,100	648,650
Funded Capacity	247,223	82,461	31,745	361,429
Difference	171,027	89,839	26,355	287,221

[1] Excludes 5,050 special students in the junior colleges.
[2] Excludes 4,900 students at the San Francisco campus and the UCLA Medical Center.
[3] Excludes 2,750 special students in the independent colleges and universities.

the figures presented here would be materially changed. The enrollment figure for the public junior colleges in 1975 would change from 246,350 to 296,350, and the "difference" figure between funded capacity and projected enrollment would change from 76,330 to 126,330. Similarly, the percent of increase over funded capacity necessary to meet projected enrollment need would change from 44.9 to 74.3. Assuming an optimum junior college size of 3,500 (see pages 52 and 69), this shift alone would amount to the *equivalent* of fourteen more junior colleges.

Unused Physical Capacity for Graduate Students at the Doctoral Level

The Technical Committee on Institutional Capacities and Area Needs undertook to determine the present unused physical capacity for the accommodation of graduate students. In the main, this report is limited to unused physical space for graduate students at the doctoral level in the University of California and the independent colleges and universities granting the Ph.D. or an equivalent degree.[2] The purpose was to determine as accurately as possible how many additional graduate students could be accommodated in the state's total system of higher education, public and private, in existing physical facilities. It was made clear to each chief campus administrator from whom information on this issue was solicited that the information requested concerned itself with physical space and facilities only, disregarding the possible staffing problems and also disregarding any office space that might be needed for possible staff additions. Each chief campus officer was asked to give his best estimate of how many more graduate students, by departments and by master's and doctoral level, his institution could accommodate with present physical facilities than were served in the fall semester 1958. Although the reports were not conclusive, they indicate that there is presently capacity for some additional expansion at the master's degree level.

Responses from the universities in California granting the Ph.D. or an equivalent degree indicate the following unused physical capacity for graduate students at the doctoral level (excluding medical and other professional schools):

1. In the fall semester 1958, there was unused physical capacity for the accommodation of 1,137 graduate students at the doctoral level. This unused space is distributed among approximately fifty departments in seven institutions of higher learning.

2. The five subject-matter fields having most physical capacity to accommodate additional graduate students working at the doctoral level are: agriculture, education, English, modern languages, and social science.

3. Although sixty-eight departments in the responding institutions indicated no unused space for graduate students at the doctoral level, more than a score of departments indicated they could accommodate three or less additional graduate students working at the doctoral level.

4. The unused physical capacity for graduate students working at

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[2] As identified in the U. S. Office of Education Directory, *Part 3, Higher Education, 1958–1959.*

the doctoral level varies between institutions and between departments within institutions.

Major Findings

1. The "assured construction capacity" (or funded capacity) of the colleges and universities of the state for full-time students, most of which will be completed by 1963, is 32.6 per cent greater than their fall 1958 capacity.

2. To meet the estimated enrollment of some 648,000 full-time students in 1975, this total assured construction capacity of some 361,000 students must be increased by 79.5 per cent.

3. The projected enrollment for 1975, the funded capacity, and the capacity to be constructed by 1975 in order to meet enrollment needs, are as follows for each segment of *public* higher education in the state:

Segment	Projected 1975 Enrollments	Funded Capacity	Capacity to Be Constructed by 1975	Per Cent Increase Necessary
Junior Colleges	246,350	170,020	76.330	44.9
State Colleges	200.000	68,483	131,517	192.0
University of California	131,100	51.500	79,600	154.6
Totals	577,450	290,003	287,447	99.1

4. The funded capacity figure and the projected 1975 enrollment figure for all levels in the independent colleges and universities are very close—with a difference of 226 capacity over projected enrollment. At the graduate level alone, however, there is a capacity excess of nearly 4,000 over projected 1975 graduate enrollment.

5. To complete the "funded" expansion already authorized in the state colleges and the University of California will require $66,824,640 not yet appropriated by the Legislature.

6. Fifty-eight per cent of the public junior colleges will each have after completion of funded construction at least 10 per cent as many library study stations as capacity for full-time students, thus meeting the minimum recommended by the American Library Association for junior colleges without residence halls.

7. Five of the thirteen state colleges and four of the five University of California campuses will each have, after completion of funded construction, at least one-third as many library study stations as capacity for full-time students. A seating capacity of at least one-third of enrollment is the minimum recommended by the American Library Association for colleges and universities.

8. Evidence indicates that the colleges and universities of the state can accommodate some additional candidates for the master's degree.

9. California institutions offering degrees at the doctoral level estimate that they have capacity for approximately 1,100 additional students at that level, with the most room for such additional students in the fields of agriculture, education, English, modern languages, and social science.

Conclusions

1. Since junior college students usually attend institutions close to their homes, the small excess capacity for junior college students reported in this section will have little or no effect on the need for additional junior college facilities on the statewide level.

2. If policies at the state level should cause the diversion of 50,000 students from the lower divisions of the state colleges and the University of California to public junior colleges by 1975 (an equivalent of fourteen junior colleges, assuming an optimum size of 3,500), the following changes in relevant figures for the public junior colleges would result:

Junior Colleges	Projected 1975 Enrollments	Funded Capacity	Capacity to Be Constructed by 1975	Per Cent Increase Necessary
With No Diversion..............	246,350	170,020	76,330	44.9
With Diversion of 50,000 Students	296,350	170,020	126,330	74.3

3. The excess of capacity over enrollments in the independent colleges and universities at the graduate level (see Number 4 under "Major Findings") represents available capacity presently existing that might substantially relieve the enrollment pressures in the public institutions. It would seem proper that thought be given to a method, such as state-provided scholarships or fellowships, whereby this capacity might be used, as was earlier recommended in the *Restudy*, thus obviating the need for construction of duplicating facilities at state expense.

Section III

UTILIZATION OF PHYSICAL PLANTS

"Providing adequate physical plant facilities is one of the greatest problems of higher education today—a problem that can never be definitely and finally solved because education is not a static process. The student population grows, its makeup alters, and its demands on the educational plant change. Equally important, teaching methods alter and improve and subject matter fields expand, requiring new kinds and amounts of space and equipment. Techniques of research—the increasingly vital product of our colleges and universities—are in a constant state of change, and new public services are created, demanding new solutions to space problems."[1]

Certainly not a new problem related to the ever-pressing and continuing need for additional facilities to meet mounting enrollments is the problem of utilization of existing and proposed facilities. To what degree are existing plant facilities used? To what degree should existing facilities be used? Are there devices, techniques, or procedures that might be adopted for greater utilization of existing and expanded educational facilities without diminishing the effectiveness of the educational and research programs? To these questions this Committee has directed its attention, bearing in mind that *no device or procedure has merit if it hampers or limits the potential of the educational and research programs.*

"A state-supported institution must demonstrate cogently to the state legislature—and ultimately to the people of the state—how it can best serve the state in the coming years at least cost."[2] A study of utilization, and particularly of devices or methods for increasing utilization, is one method of making this demonstration.

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[1] William T. Middlebrook, *How to Estimate the Building Needs of a College or University.* Minneapolis, University of Minnesota Press, 1958, p. 3.

[2] *Ibid.*

In California, governing boards and administrative officers of the state-supported colleges and the University have been acutely aware of the need to justify each new proposal for expansion on the basis of a demonstrated need. This need, in part, must relate to the utilization of existing facilities.

There are certain generalizations that help to establish the framework around which this study has been made. Briefly stated they are:

1. The extent of the utilization of existing facilities at most institutions *can be increased*. There are, however, no absolute criteria by which one can determine the extent to which increased utilization of existing facilities will increase the potential number of students who can enroll at a given institution.

2. Utilization standards, although necessary as a measuring device, cannot be applied precisely to all institutions without modification or adjustment to fit justifiable differences.

3. To achieve increased utilization may well require new and imaginative approaches to many long-established and traditional techniques of registration, room scheduling, class sizes, and even teaching methods.

4. To achieve increased utilization at any given institution will require the maximum in cooperation from all elements of the college staff as well as from the students.

5. The ultimate goal toward which institutions should strive is probably never attainable—the mythical 100 per cent utilization.

If it were possible to control exactly the number of students to be admitted to any campus, if these students were required to complete courses of study in a precisely determined and fixed sequence, if no student could use any instructional facility at other than his scheduled hour, and if no community group were permitted to use the facilities of the institution, room and student station utilization could approach 100 per cent for the school day and for the school week. However, in California, as elsewhere, these factors are not constant. Enrollments fluctuate, students' interests vary, new discoveries open new careers, new pressures force changes in educational goals. The non-scheduled use of a laboratory may be equally important to its use during a regularly scheduled class. The use of campus facilities by non-student groups may be vitally important not only in maintaining good relations between the college or the university and the state it serves, but also in the work that such groups, professional and non-professional accomplish. For example, during the calendar year 1958—January 1 to December 31—the Davis campus of the University of California was host to seventy-five separate conferences, schools, and meetings in addition to those scheduled by on-campus groups. These ranged from one-day affairs to conferences lasting four to six weeks. Facilities used ranged from a single room to over a score of rooms. Attendance ranged from the eight individuals attending the meeting of the Water Use Policy Team to the 1,200 attending the Annual 4-H Convention. These factors, and others equally compelling, limit the degree to which instructional rooms and the individual student stations can be scheduled.

There have been two fairly recent studies in California that have concerned themselves, in part, with the matter of utilization. In 1948 the "Strayer Report"[3] and again in 1955 *A Restudy of the Needs of California in Higher Education*[4] presented detailed analyses of data related to plant capacity and to plant utilization. In both reports specific recommendations were made, and the *Restudy* in particular gave consideration to the total problem of developing a balanced campus. One of the most significant contributions of the *Restudy* was the development of standard floor areas per full-time student that included not only classrooms, seminar rooms, and teaching laboratories but also libraries and study halls, departmental and administrative offices, cafeterias, health service areas, shops, storage rooms, and other areas for functions and for services equally important.

The intent of this study is not to duplicate previous analyses of space standards and room uses but rather to review these standards and recommendations to determine the extent to which they have been implemented and the degree to which they have been instrumental in achieving greater utilization, if such is the case.

Specifically, the purposes of this study are:

1. To review existing standards of utilization as developed both by the "Strayer Report" and by the *Restudy* of 1955.
2. To determine, if possible, the extent to which existing standards are being achieved.
3. To recommend modifications of existing standards for both room utilization and student station utilization where such is needed.
4. To propose additional devices, techniques, and procedures that could and would, if applied, increase still further the utilization of both classrooms and student stations.

Plant Utilization and Utilization Standards

In the fall semester, 1947, the scheduled utilization of instructional rooms (classrooms, seminar rooms, and teaching laboratories) in the state colleges in California ranged from an average of 19 hours per week at Humboldt State College to 30 hours per week at San Diego State College. During this same period the range in utilization of instructional rooms at four of the major campuses of the University of California was from an average of 15 hours per week at Davis to 30 hours per week at Los Angeles.

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[3] Monroe E. Deutsch, Aubrey A. Douglass, and George D. Strayer, *A Report of a Survey of the Needs of California in Higher Education*. Berkeley, University of California, 1948.

[4] McConnell, Holy, and Semans, *op. cit.*

Between 1947 and 1953 certain changes occurred that directly affected utilization. New state colleges were established in Long Beach, Los Angeles, and Sacramento. Each of these had some effect upon enrollments elsewhere in the state. More significant than the impact of these newer institutions were the construction programs at all the state colleges and at the several campuses of the University that greatly increased the instructional facilities available. With this impact of rapid expansion, the utilization of instructional rooms in the fall of 1953 was lower in almost every instance than the utilization achieved in the fall of 1947. Within the state colleges for which comparable data are available the range, as will be seen from Table 6, was from 16 hours average room use per week at Humboldt to 25 hours per week at San Francisco. The new Kellogg-Voorhis campus of the California State Polytechnic College had an average utilization of 19 hours per week, whereas the newly established state colleges at Long Beach, Los Angeles, and Sacramento had average utilization of 35, 30, and 27 hours per week respectively. Within the University system, the range in utilization was from 14 hours average room use at Davis to 28 hours average room use at Los Angeles.

Since the fall semester of 1953 the state colleges and the University have adopted standards for both room utilization and student station utilization to be used in the planning of all new construction. Comparisons between the average use of instructional rooms in fall, 1947, and fall, 1953, and that which would have been achieved with current standards applied to the facilities available in 1953, are summarized in Table 6.

During the period 1947–1948 the Strayer Committee studied the scheduled use of the instructional rooms, laboratory and non-laboratory, of seven state colleges and four campuses of the state university. It was the expressed judgment of this committee that an average utilization of 29 hours per week be accepted as an attainable standard for the total instructional rooms (laboratory and non-laboratory combined) in estimating the capacity of the California state colleges and the various campuses of the University.[5]

The staff for *A Restudy of the Needs of California in Higher Education* made a more detailed analysis of room and student station utilization and, on the basis of utilization actually achieved in both general classrooms and teaching laboratories, recommended a standard room utilization for classrooms of 36 scheduled hours per week, with class enrollments after the first month of the term averaging 67 per cent of room capacity, and a standard room utilization for teaching laboratories of 24 scheduled hours per week, with class enrollments after the first month of the term averaging 80 per cent of room capacity.[6] This recommendation was subsequently approved as a goal by both the State Board of Education and The Regents of the University of California.

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[5] Deutsch, Douglass, and Strayer, *op. cit.*, p. 67.

Table 6

Scheduled Utilization of Instructional Rooms, Fall 1947 and Fall 1953, Compared to Utilization with Current Standards[1] Applied to Fall 1953 Facilities

Institution	Average Number Hours Per Week, Fall 1947[2,5]	Average Number Hours Per Week, Fall 1953[3,5]	Average Number Hours Per Week Had Current Utilization Standards Been Achieved, Fall 1953[3,4,5]
State Colleges			
California State Polytechnic			
San Luis Obispo	21	21	25–27
Kellogg-Voorhis	..[6]	19	25–27
Chico	22	21	23–27
Fresno	24	20	24–27
Humboldt	19	16	22–26
Long Beach	..[6]	35	26–28
Los Angeles	..[6]	30	26–28
Sacramento	..[6]	27	25–27
San Diego	30	22	25–28
San Francisco	22	25	25–27
San Jose	28	22	25–27
University of California			
Berkeley	22	19	31
Davis	15	14	28
Los Angeles	30	28	29
Santa Barbara	25	21	29

[1] State college standards used in determining building needs are based upon a 45-hour week, 8:00 a.m. to 5:00 p.m., Monday through Friday. University standards are irrespective of length of school week.

[2] SOURCE: Monroe E. Deutsch, Aubrey A. Douglass, and George D. Strayer, *A Report of a Survey of the Needs of California in Higher Education* (Berkeley: University of California Press, 1948), Table IX, p. 65.

[3] SOURCE: T. R. McConnell, T. C. Holy, and H. H. Semans, *A Restudy of the Needs of California in Higher Education* (Sacramento: California State Department of Education, 1955), Table 30, p. 320.

[4] Standards of Utilization: *State Colleges*—Classrooms, 30 hours; special activity rooms, 25 hours; teaching laboratories, 20 hours. (Since 1953 data did not report activity rooms separately, both the 20-hour and the 24-hour standards are used to establish the range within which each college would fall.) *University of California*—Classrooms, 36 hours; teaching laboratories, 24 hours.

[5] Recorded to nearest whole number.

[6] Not included in 1947 study.

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[6] McConnell, Holy, and Semans, *op. cit.*, p. 321.

Since the *Restudy* standards were determined separately for classrooms and for the teaching laboratories whereas the standards recommended in the "Strayer Report" were for classrooms and teaching laboratories combined, it was necessary to convert the *Restudy* standards to a single figure for each campus in order to make any comparison between the two recommendations. Table 7 presents these converted figures and compares room utilization resulting from the application of the Strayer Committee standards and those of the *Restudy* to the eleven state colleges and the four campuses of the University included in the 1953 survey. It will be noted from this table that when the two standards are actually applied to the institutions there is very little difference between them.

Table 7

Comparison of the "Strayer" and *Restudy* Utilization Standards When Applied to the Instructional Rooms in Use, Fall 1953, in the State Colleges and the University of California

Institution	Average Hours Per Week for All Instructional Rooms According to:	
	"Strayer" Standards[1]	*Restudy* Standards[2]
State Colleges		
California State Polytechnic		
San Luis Obispo	29	30
Kellogg-Voorhis	29	30
Chico	29	28
Fresno	29	29
Humboldt	29	27
Long Beach	29	31
Los Angeles	29	31
Sacramento	29	30
San Diego	29	30
San Francisco	29	29
San Jose	29	30
University of California		
Berkeley	29	31
Davis	29	28
Los Angeles	29	29
Santa Barbara	29	29

[1] As noted in the text the "Strayer" standard was 29 hours per week for all instructional rooms, i.e., both classrooms and laboratories.

[2] The figures in this column have been derived as follows: At Chico State College, for example, there were nine classrooms and ten teaching laboratories in use in the fall of 1953. The classrooms are multiplied by 36 and the laboratories by 24 (*Restudy* standards respectively) and the sum of these then divided by 9, which gives 28. These are all recorded to the nearest whole number.

It is important to keep in mind that these standards, although based upon verifiable data, are still judgments, and may be either too low or unreasonably high. There is to date no evidence that will prove conclusively what can and what cannot be achieved. The University of California is using *Restudy* standards in projecting its building needs, but it is the studied opinion of the chief planning analyst for the University that these standards cannot be achieved. The experience of the state colleges has caused the Department of Education, with the consent of the State Department of Finance, to adopt standards somewhat below the *Restudy* standards. Facilities needed for the state colleges are based upon utilization standards that call for an average room use of 30 hours per week with 75 per cent student station utilization for all classrooms and seminars, an average room use of 25 hours per week with an 85 per cent student station utilization for all activity rooms, and 20 hours of room use per week with 85 per cent utilization of student stations for all teaching laboratories.

Among the junior colleges, standards for planning new facilities as reported in 1959 range from a classroom use of 20 hours per week with 70 per cent station utilization to 48 hours per week with 90 per cent student station utilization. The range in activity rooms is from 17 hours per week with 67 per cent utilization to 40 hours per week with 90 per cent student station utilization. For teaching laboratories, the range is from 20 hours per week with 50 per cent utilization to 48 hours per week with 90 per cent utilization. The data here presented are for planning purposes only and do not represent attained utilization.

Russell and Doi[7] studied the room utilization of fifty-seven institutions scattered throughout the nation, maintaining programs leading to the bachelor's or higher degree. They found extreme ranges in both room use and student station utilization. Those institutions ranked at the 50th percentile had an average room use of 19.9 hours per week for general classrooms, 13.2 hours for teaching laboratories, and the average for all instructional rooms was 17.4 hours per week. The student station utilization for these same institutions was 45.2 per cent in general classrooms, 30.0 per cent in teaching laboratories and 39.5 per cent in all instructional rooms. Even at the *90th percentile* neither room use nor student station utilization equalled the standards recommended in the "Strayer Report" or the *Restudy*. Table 8, taken from the Russell and Doi study, shows the range in utilization of these fifty-seven institutions.

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[7] John Dale Russell and James I. Doi, *Manual for Space Utilization in Colleges and Universities*. American Association of Collegiate Registrars and Admissions Officers. Menasha, Wisconsin, George Banta Co., 1957, p. 115.

These findings are most significant because they indicate quite clearly that the modifications of the "Strayer Report" standards that are currently being used in the determination of needs at the state colleges are among the highest standards in the nation. Nonetheless, every effort must be continued to achieve even greater utilization in the face of continually rising costs and capital outlay needs of education in California.

Table 8

Percentile Ranking of Room Period Utilization Scores, Based on Fifty-Seven Institutions in the United States Maintaining Programs Leading to the Bachelor's or a Higher Degree

Percentile Rank	General Classrooms		Teaching Laboratories[1]		All Instructional Rooms	
	Average Number of Periods Per Week Per Room	Percentage of Possible Utilization on 44-Hour Weekly Basis	Average Number of Periods Per Week Per Room	Percentage of Possible Utilization on 44-Hour Weekly Basis	Average Number of Periods Per Week Per Room	Percentage of Possible Utilization on 44-Hour Weekly Basis
99.............	38.0	86.4%	32.0	72.7%	35.0	79.5%
90.............	28.8	65.5	21.0	47.7	24.8	56.4
80.............	26.0	59.1	18.3	41.6	21.7	49.3
70.............	23.2	52.7	16.7	38.0	20.3	46.1
60.............	21.2	48.2	15.1	34.3	19.1	43.4
50.............	19.9	45.2	13.2	30.0	17.4	39.5
40.............	18.9	43.0	11.8	26.8	16.6	37.7
30.............	16.3	37.0	9.8	22.3	15.0	34.1
20.............	14.8	33.6	8.7	19.8	13.3	30.2
10.............	12.3	28.0	7.0	15.9	11.2	25.5
1.............	7.0	15.9	1.0	2.3	6.0	13.6

[1] For fifty-five institutions only; two institutions report no teaching laboratory.

SOURCE: John Dale Russell and James I. Doi, *Manual for Space Utilization in Colleges and Universities* (American Association of Collegiate Registrars and Admissions Officers, Menasha, Wis.: George Banta Co., 1957), p. 115.

Possible Methods of Increasing Utilization

Expert opinion from the literature and from judgment born of practice has been sought in an effort to determine what new practices, what modifications of existing practices, and what purely theoretical practices might be proposed in an effort to effect greater utilization of physical facilities in colleges and universities. Time limitations of this study have not permitted thorough, comprehensive studies of some of the following proposals and space limitations of this report do not permit lengthy or detailed presentation. The Committee is convinced that these proposals deserve further and continued serious study if California is to meet ever-increasing demands for additional use and expansion of existing college and university plants. It is pointed out that not all proposals could be applied on a statewide basis by all institutions and with the same degree of acceptance. They are intended to stimulate study, discussion, and possible adoption where and when feasible.

1. Class or room scheduling. Here, certainly, is one of the most significant factors in plant utilization. Loose, uncontrolled, decentralized, department or division dominated methods of class and/or room scheduling are the most serious hindrance to better utilization. It is obviously impossible to arrange a complex schedule of teachers, courses, hours, and spaces in advance of registration and expect enrollment at the beginning of a term to match exactly the seats available in each case. However, traditionally uncontrolled faculty scheduling often produces a great disparity between morning and afternoon use. Here are some proposals in the area of scheduling:

a. Require departments to schedule as many organized classes between 12:00 noon and 5:00 p.m. as between 8:00 a.m. and 12:00 noon (*Restudy* suggestion).

b. In addition to traditional scheduling of three-hour classes on Monday, Wednesday, and Friday, also schedule some three-hour classes on Tuesday, Thursday, and Saturday morning. Consideration should also be given to scheduling three-hour classes on Tuesday and Thursday using one and one-half hours on each of the two days (*Restudy* suggestion).

c. Larger classes where possible.

d. Schedule resident students for evening classes—especially laboratory classes where need is great and utilization generally low.

e. Centralize control on each campus of all instructional spaces, particularly those spaces used by more than one department. (Exceptions may need to be made for professional schools such as medicine, etc.)

f. Use group or block scheduling methods. This technique has inherent possibilities for providing more efficient use of spaces and leveling of peak-hour loads. It does require major modifications in existing procedures. It assumes that all students of a certain group or block (level such as freshman or major such as elementary education) are available for a 40- to 45-hour week and that modifications can be made for those students who must work. This procedure has certain curriculum limitations; it restricts possible electives; and it requires earlier registration and advisement, possibly pre-registration. However, it is a technique that deserves further study.

2. Use of electronic equipment for registration (scheduling) pro-

cedure. This procedure was recently installed by Purdue University, which enthusiastically reported the following results:

a. Schedules all divisions evenly.

b. Schedules classes in relation to room capacities more evenly. (Better utilization).

c. Gives instructors more balanced loads.

d. Schedules free time for those students who need it.

e. Lets students choose their own courses.

f. Requires pre-advising and pre-registration but frees counselors to advise rather than counsel.

3. Extension of school day to include evening classes (not to be confused with adult education program at junior colleges.) Some of the state colleges and some campuses of the University are scheduling classes in the evening hours but mainly for what is termed the "limited or part-time" student. It is urged that greater consideration be given to the development of expanded curricular programs to include regular full-time students. This would, in effect, increase utilization of all facilities. There are, of course, concomitant problems of staffing, use of auxiliary facilities such as library, cafeteria, parking, housing, and even maintenance problems to be considered.

4. Trimester or three-term year. This plan, recently adopted at the University of Pittsburgh, divides the year into three semesters of almost exact length. This provides for the usual holidays, the Christmas recess, a Spring recess, short registration periods, and examination periods. Most school calendars now provide for a sixteen- to eighteen-week semester. This would condense the semesters to about fourteen weeks each. It would require only a minimum of curriculum adjustments but would have major implications in other areas. It would necessitate adjustments in staff, maintenance schedules, intercollegiate athletic schedules, and established recreation habits and patterns of students and families. If students were permitted to enroll for only two out of the three periods, additional enrollments could be provided. On the other hand, if students were allowed to enroll for consecutive periods, their progress toward graduation would be accelerated. This scheme would provide a means of increasing plant utilization in terms of its sum-total effects.

Also, this plan would necessitate adjustments to meet the needs of teachers in the public schools, since the traditional summer-school program is largely designed for teachers. However, this administrative adjustment could be made by running a summer session for teachers of either six or eight weeks parallel with the summer or third term, as was done during World War II.

5. The quarter system. Another proposal is that the academic calendar be divided into four terms of equal length. This plan has most, if not all, the advantages of the trimester or three-term year, and, in the opinion of many, fewer disadvantages. It has a long history and is in effect in many of the foremost colleges and universities of America. Among these institutions are California State Polytechnic College, Ohio State University, Stanford University, and the Universities of Chicago, Minnesota, Oregon, and Washington.

6. Equal distribution of students. It is undoubtedly true that utilization of physical facilities of colleges and universities can be greatly increased. The average estimate seems to be 25 per cent. It might be made higher by use of the trimester or three-term plan or by the quarter plan. The crucial point is the equal distribution of students in each term.

It is imperative that the state-supported colleges and universities of California make the best possible use of their physical facilities and those responsible for the administration of these colleges and universities find ways and means of effecting an equal distribution of students. The problem of providing higher education for all qualified students in California is such that it may be necessary for the state to require equal distribution of students over either the trimester, three-term plan, or the quarter plan in state-supported colleges and universities.

7. Adoption of a uniform calendar for kindergarten through graduate school. This type of calendar would provide for the same opening and closing dates for the terms of the school year in all segments of state-supported education. A uniform calendar could greatly expand the possibilities for better utilization of physical facilities. It would provide for maximum articulation for students at all levels with no over-lapping. Serious breaks in the continuity of a student's education can be and often are caused by variations in the beginning and ending of semesters that exist in the various segments by virtue of differences in calendars. A uniform calendar would also provide adequately for the in-service training of California's teachers.

Modification of Existing Space Standards

As has previously been noted, one of the most significant contributions of the *Restudy* was the development of recommended standard floor areas for classrooms, for teaching laboratories, and for all the services and functions that constitute a college or a university campus. It is the considered judgment of the staff of the Technical Committee on Institutional Capacity and Area Needs that these recommended standards are the best available upon which to base a building program.

However, it is the judgment of this Committee that these standards need constant review and possible revision, not only to reflect the changes recommended for room and for student station utilization, but also to reflect accomplished changes in the services provided and the functions performed since the *Restudy* was submitted.

Until 1959–1960 student dormitories were not available on most state college campuses. Because of this, the health service facilities have been limited to those required for dispensary service only. With the development of on-campus living facilities for students, there should also be an expansion of health services to include infirmary care.

At the time of the *Restudy* in 1955, graduate programs in the state colleges were generally limited to teacher education and to its allied fields. Research was considered the exclusive function of the University. The recommended standard floor areas proposed for state colleges in the *Restudy* reflect these limitations. Since that time the state colleges have been authorized to extend their graduate programs and currently grant the master's degree in a variety of subject fields, including the humanities, the biological and physical sciences, mathematics, and the social sciences, as well as in occupational fields.

The Technical Committee on Institutional Capacities and Area Needs believes that these changes in the program of the state colleges and the addition of dormitory facilities should be recognized in the development of space standards applied to the building program of this segment.

Major Findings

1. Utilization standards recommended in the *Restudy* are based upon maximum utilization achieved fall semester, 1953, irrespective of length of school week. The evidence is that these standards are not achieved in the state colleges and the University of California. Highest utilization is achieved in metropolitan centers where classes are scheduled for late afternoons and evenings.

2. Russell and Doi[8] studied the room utilization of fifty-seven institutions maintaining programs leading to the bachelor's or higher degree and found that even at the 90th percentile neither room use nor student station utilization equaled the standards recommended in either the "Strayer Report" or the *Restudy*.

Conclusions

1. Standards of utilization for both instructional rooms and for student stations should be the same for all segments of publicly supported

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[8] *Ibid.*

higher education in California and should be based upon a precisely defined school day and school week.

2. Standards of utilization recommended in the *Restudy* and the standards recommended in the "Strayer Report" are high and will not be achieved. More moderate standards should be established.

3. Extreme variations in density of population in the areas served by a college or a campus of the University must be recognized as unique conditions and treated as such.

4. All types of scheduled learning activities can be satisfactorily categorized as either "laboratory" or "non-laboratory."

5. Two of the factors that adversely affect the utilization of instructional facilities in institutions of higher education are the controls exercised by various departments of instruction over certain classes and certain assigned space and the lack of an articulated school calendar.

6. The problem of optimum use of physical facilities of a college or a university is exceedingly complex and technical. There is no simple and easy answer to the question: What is the optimum use of the physical plant of a given institution? Optimum utilization depends upon many factors—the function of the institution, its objectives, the layout and design of the plant, library facilities, student housing, teaching methods, differentiation between lower division, upper division, and graduate work and the emphasis placed on each, health services, the economic status of the student body, the research programs, distances that students must travel to the campus, the student activity program, the length of the school day and the week, whether or not the institution is on the semester, trimester, or quarter plan, offices provided for staff, scheduling procedures, and so on. The *Restudy* set forth a formula to use in determining needed plant expansion in the state colleges and the University of California. Experience has shown that the formula is too high, but as yet no one knows what it should be. There is danger in the continued pretence of maintaining the *Restudy* standards. The danger is that this standard may come to have the force of "unwritten law." On the other hand it is exceedingly important that the solution to better space utilization be discovered and made available for all segments of public higher education in California.

It will be greatly to the advantage of the state to have this study made by a thoroughly competent staff over a long enough period of time to get the facts, evaluate them, and, when necessary, experiment with different formulae and methods of scheduling classes—all in terms of the functions of the college or university. Obviously the functions of a junior college differ greatly from those of the University of California.

The Committee believes that such a study carried out over a period of perhaps two years would be of great benefit to the state.[9]

Recommendations

The Technical Committee on Institutional Capacities and Area Needs recommends that:

1. *The standard utilization of classrooms in the junior colleges, state colleges, and the University of California be on the average thirty scheduled hours per week with class enrollments after the first month of the term averaging 60 per cent of room capacity.*

2. *Standard room utilization of teaching laboratories in the junior colleges, the state colleges, and the University of California be on the average twenty scheduled hours per week with class enrollments after the first month of the term averaging 80 per cent of room capacity.*

3. *Utilization standards used for determining the need for instructional facilities for junior colleges, state colleges, and the University of California be based upon the number of students to be accommodated in a 45-hour week, 8:00 a.m. to 5:00 p.m., Monday through Friday.*

4. *In areas where the concentration of population is sufficiently high to make it feasible, as well as on residential campuses, maximum use of physical facilities be made by scheduling classes in the late afternoon and evening and when possible on Saturdays, and that a maximum number of classes be scheduled on Tuesdays and Thursdays.*

5. *The scheduling of instructional facilities be centrally controlled on each campus but with such exceptions as may be approved by the appropriate governing body (such exceptions including medicine, other professional schools, and the like).*

6. *Continued study be given to problems of plant utilization by each college and university, such study to be related to the educational programs and such changes in functions and purposes as may affect this utilization.*

7. *Space provisions for health services be increased to allow for infirmary care on campuses where dormitories are provided.*

8. *The need for space for graduate programs in the state colleges be recognized and that such space be provided, and, further, that the standard floor areas for those services and functions directly related to graduate programs (libraries and study halls, staff research space,*

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[9] Subsequent to the completion of this study, the 1960 Special Session of the Legislature adopted HR 16, which requests the Department of Finance and the Legislative Analyst with the assistance of the Department of Education and the University of California to make a study of standards or utilization and occupancy of instructional areas "and to submit a report to the 1961 session."

shops, storage areas, and other ancillary areas) be increased so as to provide space adequate to their functions.

9. *A continuing Committee on Institutional Capacities and Area Needs be established by the Liaison Committee or the existing coordinating agency and that this Committee undertake, among other studies, the following:*

a. *A complete study of the current utilization in the junior colleges, state colleges, and the University of California (no such study has been made since 1953–54) for the specific purpose of making such modification in the above-recommended standards of utilization as are justified by the findings.*

b. *The possible economic and educational gains that might be effected by the adoption of an articulated calendar for all segments of publicly supported education in California.*

c. *The use of electronic processing equipment for both registration and room scheduling as a device for increasing efficient use of both classroom and student stations, thereby increasing utilization.*

d. *The inherent potentials of the trimester, or three-term plan, and the four-quarter plan to be studied thoroughly and intensively over a long enough period of time to produce sound, objective data to reveal precisely what effect each would have on a college or university and on their utilization of physical facilities.*

Section IV

ENROLLMENT PROJECTIONS AND NEEDS FOR PUBLIC JUNIOR COLLEGES, STATE COLLEGES, AND CAMPUSES OF THE UNIVERSITY OF CALIFORNIA

By 1975, projections indicate, more than one million students, 661,000 attending full-time, will enroll in California institutions of higher education. This is nearly triple the current enrollment and nearly one-third the present total of college students over the entire nation.[1]

Since 1946 an extraordinarily high birth rate combined with a huge inmigration has produced a flood of students in this state, which, despite a capital outlay in California's public schools of more than $1,762,000,000[2] during the five-year period from 1953–54 through 1957–58, has overwhelmed the elementary and secondary schools. This burgeoning student population is now beginning to move into the colleges and universities of the state and will rise rapidly after 1962.

At the end of World War II, the birth rate in California increased by *50 per cent* and has remained near this level. With the outbreak of that war a huge migration to California began, including both civilian and military personnel. It has continued to the present and is expected to remain over 300,000 annually in the years ahead.[3] California's population, now approaching fifteen million—as taken from the June 17, 1960, issue of *The New York Times* (the 1960 census is 15,537,413)—

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[1] Total California enrollments in higher education for 1975 are projected as 1,036,050 by the State Department of Finance Research Section. Total degree-credit enrollment in all institutions of higher education in the United States in the fall of 1958 was 3,258,556. See *Opening (Fall) Enrollment in Higher Edecation, 1958: Analytic Report*. Washington, U. S. Office of Education, Cir. #545, 1959.

[2] Ray G. Johnson, "Financing the Acquisition of Capital Assets for the California Public Schools for Five Fiscal Years, 1953–54 through 1957–58," *California Schools*. Sacramento, State Department of Education, October 1959, Table 8, p. 427.

[3] *California Population in 1958*. Sacramento, State Department of Finance, Budget Division, Financial Research Section, July 1958, p. 5.

will increase to more than twenty-one million in 1970, twenty-nine million in 1980, thirty-seven million in 1990, and forty-five million in 2000, when *three* times its present population will reside in this state.[4]

Delimitation of This Study

1. *As to Time.* The projections and other data of this study do not go beyond the year 1975. At least until that time, the number of students that will be enrolled can be foretold with a fair degree of accuracy. Most of the students who will seek college enrollment by 1975 can be estimated with assurance on the basis of births already recorded. For example, the 250,960 enrolled on March 31, 1959, in the fifth grade of the state's public schools, the 28,000 in the same grade in parochial schools, plus an additional number from inmigration, will form the high school graduating class of 1965–66; from these graduates, in large part, will come the college freshmen of 1966–67 and the college seniors of 1969–70.

There is an even more important reason for selecting 1975 as the limit of this study. To provide adequate facilities until that time will require immediate action. Not only are needs to be appraised and kinds of institutions and locations determined, but also sites must be acquired, buildings constructed, libraries developed, faculty members recruited, curricula and courses established. Even with the utmost expedition, it is still likely that the students will arrive before the facilities have been developed to accommodate them.

2. *As to Institutions.* Public institutions included in the projections are those existing and authorized. Thus, the junior colleges include those now operating plus the College of the Desert near Indio, the state colleges include those presently in full operation plus Alameda, Orange County, Stanislaus, and North Bay state colleges. The University of California campuses include those presently in operation plus those authorized by The Regents of the University of California, namely Southeast Los Angeles–Orange County, South Central Coast, and San Diego–La Jolla campuses.

The independent institutions included in this study are those listed in the *United States Office of Education Directory of Higher Education, 1958–59.*

3. *As to Students.* Except in a few tables, where the difference is indicated, only full-time students have been counted. Use of the "full-time student" (one taking twelve or more units of work) avoids many complications and difficulties in calculation and affords an approximate measure of the *relative* size and workload of the various colleges and

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[4] Unpublished study by Van Beuren Stanbery, San Francisco, May 1958.

universities, all of which have been able to supply data on this basis. Moreover, assuming that evening students can use the same facilities, physical planning should be in terms of day attendance as full-time students ordinarily go to class only during the regular school day.

4. *General.* This study is based almost exclusively on objective data and has all the limitations as well as the advantages of such an approach.

Purpose

Through its projections and analyses, this study is designed to point out the kinds, numbers, and sizes of public institutions of higher education that will be needed in California to meet the needs of its qualified students between now and 1975 and to suggest the general location of such institutions. More specifically, the study seeks to describe:

1. The general magnitude of the problem in terms of projected increases in high school graduates and college enrollment potentials.
2. The anticipated growth of college enrollments, both numerically and in rates of increase, among the different kinds of institutions by level—lower division, upper division, and graduate division.
3. The relative size and future growth of the two levels of advanced training (the Master and Doctor of Philosophy and equivalent degrees) in institutions of higher education in California in terms of degrees granted and to be granted. (Attention is also directed to the study of Faculty Demand and Supply in Section V of this Committee's report.)
4. The distribution of present and future high school graduates among the various counties and areas of the state and their relative increases, in terms of both numbers and percentages.
5. Geographical areas apparently deficient in junior colleges.
6. Geographical areas apparently deficient in state colleges and the priority of need for new colleges, beyond those already authorized, among the various areas.
7. Geographical areas apparently deficient in campuses of the University of California and the priority of need for new campuses, beyond those already authorized, among the various areas.

Assumptions

There are variables that cannot be anticipated. Educational policies may be altered; changes may occur in the economic conditions of the state, of the nation, and in the international situation; junior colleges, colleges, universities, and campuses, public and independent, may be created in addition to those presently operating and authorized; the current patterns of the attraction of students from the various areas of the state by the individual institutions may change; certain institutions of higher education may be unable to accommodate all the students projected for enrollment in them. Since the nature and extent of such changes cannot be foretold at this time, this study must assume that major policies and conditions in all such matters will remain as at present. Specifically, then, the projections developed by the State Department of Finance and used in this study are based on the assumptions that:

1. California will continue to grow rapidly in population and will reflect a high level of state and national economic development without any major economic set-backs, atomic wars, or natural catastrophes between now and 1975.
2. To 1975 the rates at which children remain in high school until graduation and the geographic distribution of high school graduates will generally follow the trends of the past decade.
3. The rates of entrance of California high school graduates into its colleges and universities will continue to increase gradually to 1975.
4. Each publicly controlled institution of higher education within each system—junior college, state college, or University of California—will continue to attract students at about its present rate and that its students will continue the current pattern of place of origin and attendance, except as modified by new institutions already operating or authorized. Implicit in this is an assumed continuation of present admission policies, curricula, and other conditions influencing enrollment.
5. Each college or university will be able to accommodate all the students who would enroll under these assumptions (thus, the projected numbers are "potentials" not restricted by site, physical plant, or other limitations that may in actuality exist).

It is assumed that, although the particular needs of localities should not be overlooked, the general interest of the state is paramount. Therefore, in determining the location of new state colleges and new campuses of the University of California, the following are the most important considerations:

1. The relative numbers of high school graduates and of existing institutions in the various areas of the state.
2. The relative numbers of potential students within reasonable commuting distance of each of the proposed sites, in order that a maximum number of students may be able to attend.
3. The relative sizes of potential enrollments, so that per capita cost may be kept at a minimum.
4. The need to accommodate numbers of students in excess of the capacities of the physical plants of some state colleges and campuses of the University of California.

Sources of Data

The data for this study regarding high school graduates and college and university enrollments have been developed by the State Department of Finance. The Technical Committee on Institutional Capacities and Area Needs obtained most of its recorded statistics from the State Department of Education and from the several institutions of higher education that responded to questionnaires.

Projections of high school graduates have employed the "grade progression" method, which, by making allowance for attrition and accretion on the basis of past and present experience, traces each elementary and secondary grade and high school class through the twelfth year. Evidence at hand indicates that this method is undoubtedly the most accurate one that has yet been developed for projections through the twelfth grade.

Projections of junior college enrollments have taken into account the tendencies of high school graduates in each of the State Economic Areas[5] to attend a junior college.

The enrollments of each state college and each campus of the University of California have been projected individually. Such projections have taken into account:

1. The estimated growth in numbers of the high school graduates in each of the several State Economic Areas.
2. The known tendency of the given college or University campus to attract a certain proportion of the high school graduates from each of these areas.
3. The annual attrition among those who enter as freshmen.
4. The accretion by transfer.

Adjustments have been made among the enrollments of the several institutions of higher education on the basis of the estimated impact upon them of newly created institutions in the same and other areas. Over-all controls have been used to insure that unreasonable projections, in terms of total college attendance in the years to come, are not made. The projected enrollments of the various independent colleges and universities have been obtained in every case from the institutions themselves.

The estimates of advanced degrees have been secured by the Technical Committee on Institutional Capacities and Area Needs directly from the administrative heads of the colleges and universities in California by means of a questionnaire.

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[5] See pages 43 and 44 for discussion and listing of State Economic Areas.

The Growth and Distribution of Enrollments

According to the projections of Table 9, the over-all picture of higher education in California is that:

1. For every four students graduated from high school in 1958 eleven will be graduated in 1975. As projected, annual high school graduates will increase by 176 per cent, from 123,807 in 1957–58 to 341,350 in 1974–75. Those from public high schools alone will increase by 177 per cent, from 114,107 to 316,050.

2. Projected freshman enrollments will increase even more rapidly. The numbers of full-time freshmen will increase by 183 per cent, from 90,054 in the fall of 1958 to 254,750 in 1975.

3. For every freshman in a state-supported institution of higher education in 1958 there will be three in 1975. As projected, those in the junior colleges, state colleges, and the University of California will increase by 200 per cent, from 78,431 to 235,550.

4. Junior college freshmen will increase at a rate slightly less and those in the independent colleges and universities at a rate far less than that of the high school graduates. On the other hand, state college freshmen will increase at a rate far greater, and those in the University of California at a rate substantially larger, than those of the high school graduates and junior college freshmen. Among the junior colleges, full-time enrollments will increase by 171 per cent, from 59,571 in 1958 to a projected 161,650 in 1975; in the state colleges, by 330 per cent, from 11,839 to 50,950; in the University of California by 227 per cent, from 7,021 to 22,950; in the independent colleges and universities by 65 per cent, from 11,623 to 19,200.

The analysis in Table 10 of present and projected college full-time student enrollments by type of institution and by level of instruction, based on a continuation of *status quo* conditions, reveals the following:

1. Total lower division enrollments will increase more rapidly than will numbers of high school graduates. The combined lower division enrollments of the junior colleges, state colleges, University of California, and independent colleges and universities will increase by 190 per cent, from 144,080 in 1958 to 418,250 in 1975.

2. The largest rate of increase in projected lower division enrollments will be in the state colleges, followed in order by the University of California, the junior colleges, and the independent colleges and universities. State college lower division enrollments, according to projections, will increase by 358 per cent, from 20,052 in 1958 to 91,750 in 1975; those of the University of California by 227 per cent, from 14,030 to 45,900; of the junior colleges by 176 per cent, from 89,206 to 246,350; and of

the independent colleges and universities by 65 per cent, from 20,792 to 34,250.

3. The largest rate of increase in projected upper division enrollments will also be in the state colleges, followed in order by the University of California and the independent colleges and universities. State college upper division enrollments will increase by 344 per cent, from 21,701 in 1958 to a projected 96,300 in 1975; those of the University of California by 212 per cent, from 16,149 to 50,450; those of the independent colleges and universities by 49 per cent, from 17,174 to 25,550.

In 1958, 40 per cent of all upper division enrollments in California colleges and universities was in the state colleges, 29 per cent in the University of California, and 31 per cent in the independent colleges and universities. In 1975, 56 per cent of all projected enrollments will be in the state colleges, 29 per cent in the University of California, and 15 per cent in the independent colleges and universities.

4. Substantially the largest rate of increase in the projected graduate student enrollments will be in the state colleges, followed in order by the University of California and the independent colleges and universities. State college graduate student enrollments will increase by 346 per cent, from 2,681 in 1958 to a projected 11,950 in 1975; those of the University of California by 207 per cent, from 12,922 to 39,650; those of the independent institutions by 72 per cent, from 6,643 to 11,400.

In 1958, 12 per cent of all graduate student enrollments were in the state colleges, 58 per cent in the University of California, 30 per cent in the independent colleges and universities. In 1975, 19 per cent will be in the state colleges, 63 per cent in the University of California, 18 per cent in the independent colleges and universities.

5. Projected enrollments will increase somewhat more rapidly in the lower division than in the upper and graduate divisions in the state colleges and the University of California. In the state colleges, projected lower division enrollments will increase by 358 per cent between 1958 and 1975, upper division enrollments by 344 per cent, graduate student enrollments by 346 per cent. In the University of California, lower division projected enrollments will increase by 227 per cent, upper division enrollments by 212 per cent, graduate division enrollments by 207 per cent.

6. Because of the much lower projected rate of increase in the junior colleges than in the state colleges and University of California lower divisions, the total lower division enrollments of all institutions will increase less rapidly than total upper division enrollments. Combined lower division projected enrollments will increase by 190 per cent between 1958 and 1975, upper division enrollments by 213 per cent.

Table 9

Trends to 1975 in Annual Numbers of California High School Graduates and in Freshman Fall Semester Full-Time Enrollments in California Junior Colleges, State Colleges, University of California, and Independent Colleges and Universities

A. High School Graduates

Academic Year	Public High School		Private High School		Total	
	Total	Per Cent Increase Over 1957-58	Total	Per Cent Increase Over 1957-58	Number	Per Cent Increase Over 1957-58
1957-58	114,107	...	9,700	...	124,374	...
1959-60	146,400	28%	12,200	26%	158,600	28%
1964-65	203,750	78	16,400	69	220,150	78
1969-70	262,100	129	21,000	116	283,100	129
1974-75	316,050	177	25,300	161	341,350	176

B. Freshman Enrollments

Fall	Junior Colleges	State Colleges	University of California	Independent Colleges and Universities	Total
1958	59,571	11,839	7,021	11,623	90,054
1960	77,100	16,500	9,400	13,000	116,000
1965	104,750	28,250	13,500	15,450	161,950
1970	133,200	41,500	18,150	17,650	210,500
1975	161,650	50,950	22,950	19,200	254,750
Per Cent Increase Over 1958:					
1960	29%	39%	34%	12%	29%
1965	76	139	92	33	80
1970	124	250	158	52	134
1975	171	330	227	65	183

C. Number of Freshmen Per 1,000 High School Graduates

Academic Year	Junior Colleges	State Colleges	University of California	Independent Colleges and Universities	All
1957-58	479	95	56	93	723
1959-60	486	104	59	82	731
1964-65	476	128	61	70	735
1969-70	470	147	64	62	743
1974-75	474	149	67	56	746

SOURCE: State Department of Finance.

Table 10

Trends in Fall Semester Enrollments to 1975 by Level of Full-Time Students (Excluding Specials) in California Public and Independent Institutions of Higher Education

Fall	Lower Division					Upper Division			
	Junior Colleges	State Colleges	University of California[1]	Independent Colleges and Universities	Total	State Colleges	University of California[1]	Independent Colleges and Universities	Total
Actual									
1958	89,206	20,052	14,030	20,792	144,080	21,701	16,149	17,174	55,024
Projected									
1960	113,450	28,000	18,350	23,300	183,100	27,200	17,350	18,700	63,250
1965	159,350	50,350	27,150	27,600	264,450	48,300	27,850	21,500	97,650
1970	201,100	73,350	35,950	31,600	342,000	74,600	39,000	23,900	137,500
1975	246,350	91,750	45,900	34,250	418,250	96,300	50,450	25,550	172,300
Increase Over 1958									
1960	27%	39%	31%	12%	27%	25%	7%	9%	15%
1965	79	151	93	33	84	122	72	25	77
1970	125	266	156	52	137	244	141	39	150
1975	176	358	227	65	190	344	212	49	213

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[1] The University of California does not distinguish between "full-time" and "part-time" students. However, students may enroll in less than a normal program of studies only by special permission, and the proportion of such exceptions to total enrollees is believed less than 10 per cent.

SOURCE: State Department of Finance.

Table 10—*Continued*

Trends in Fall Semester Enrollments to 1975—(*Cont.*)

Fall	Graduate Division				All Levels				
	State Colleges	University of California[1]	Independent Colleges and Universities	Total	Junior Colleges	State Colleges	University of California[1]	Independent Colleges and Universities	Grand Total
Actual									
1958	2,681	12,922	6,643	22,246	89,206	44,434	43,101	44,609	221,350
Projected									
1960	3,400	14,700	7,600	25,700	113,450	58,600	50,400	49,600	272,050
1965	6,300	22,000	8,950	37,250	159,350	104,950	77,000	58,050	399,350
1970	9,200	31,100	10,300	50,600	201,100	157,150	106,050	65,800	530,100
1975	11,950	39,650	11,400	63,000	246,350	200,000	136,000	71,200	653,550
Increase Over 1958									
1960	27%	14%	14%	15%	27%	32%	17%	11%	23%
1965	135	70	35	67	79	136	79	30	80
1970	243	141	55	127	125	254	146	47	139
1975	346	207	72	183	176	350	216	60	195

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[1] The University of California does not distinguish between "full-time" and "part-time" students. However, students may enroll in less than a normal program of studies only by special permission, and the proportion of such exceptions to total enrollees is believed less than 10 per cent.

SOURCE: State Department of Finance.

Graduate Degrees by California Institutions

Table 11 reveals the currently recorded and projected numbers of master and doctoral degrees to 1975–76 as reported by the administration of each state college, each campus of the University of California, and each independent college and university granting these advanced degrees. According to these estimates:

Table 11
Numbers of Master's and Doctoral Degrees Awarded and to Be Awarded by California Institutions, 1954–55 to 1975–76

Academic Year	Master's Degrees				Doctoral Degrees[1]		
	State Colleges	University of California	Independent Colleges and Universities	Total	University of California	Independent Colleges and Universities	Total
Actual							
1954–55....	930	1,146	1,950	4,026	462	385	847
1957–58....	1,784	1,629	2,256	5,669	468	390	858
1958–59....	1,688	1,820	2,328	5,836	448	417	865
Projected							
1960–61....	1,925	2,150	2,800	6,875	640	495	1,135
1965–66....	3,250	3,500	3,650	10,400	1,220	635	1,855
1970–71....	4,800	5,175	4,300	14,275	1,900	815	2,715
1975–76....	6,775	7,175	4,950	18,900	2,435	940	3,375
Increase Over 1958–59:							
1960–61....	14%	18%	20%	18%	43%	19%	31%
1965–66....	93	92	57	78	172	52	114
1970–71....	184	184	85	145	324	95	214
1975–76....	301	294	113	224	444	125	290

[1] Ph.D. and Ed.D. degrees.

SOURCE: Questionnaires completed by institutional heads, November 1, 1959.

1. The relatively new state college program at the master's level will increase in numbers and rates approaching those of the University of California and the independent institutions of higher education. State college awards of the master's degree are expected to increase by 301 per cent, from 1,688 in 1958–59 to 6,775 in 1975–76; University of California awards by 294 per cent, from 1,820 to 7,175; the awards of independent colleges and universities by 113 per cent, from 2,328 to 4,950.

2. Instruction leading to the doctorate as reflected in the projected numbers of degree awards will increase even more rapidly than on the master's level. Total awards of the master's degree by institutions of higher education in California are expected to increase by 224 per cent, from 5,836 in 1958–59 to 18,900 in 1975–76. Awards of the degrees of Doctor of Philosophy and Doctor of Education by all institutions are estimated to increase by 290 per cent, from 865 in 1958–59 to 3,375 in 1975–76. Within the independent colleges and universities this increase will be 125 per cent, from 417 in 1958–59 to 940 in 1975–76, and in the University of California it will be 444 per cent, from 448 to 2,435.

Present and Future Geographical Distribution of Public High School Graduates

To plan wisely the creation and development of California state colleges and campuses of the University of California (as well as the junior colleges that are discussed later in this section) [illegible] terms of students' needs and of efficient use of public funds requires that account be taken of the present and projected geographical distribution to the state's high school graduates. Only by such examination can there be assurance that colleges and campuses will be so located that, without undue proliferation of institutions, a maximum number of qualified students will be able to attend at a minimum cost.

To make such a geographical analysis this study used the scheme of "State Economic Areas," which was developed and used for some years by the Research Section of the State Department of Finance. These areas are of two categories, "standard metropolitan statistical areas" and "nonmetropolitan areas." Each area comprises a county or group of counties. These State Economic Areas and the counties included in each are shown in the tabulation on page 44.

Examination of these areas reveals a wide variation in geographical size, in population as reflected in numbers of high school graduates, and in projected rates of increase in these numbers. Geographically, the ranges in size are from SEA C (Sacramento County) with only 985 square miles to SEA 9 (Sierra Area, including seventeen counties) with 48,803 square miles or 31 per cent of the state's total area. In numbers of high school graduates in 1957–58, the ranges are from SEA 8 (Imperial County) with only 615 to SEA F (Los Angeles and Orange Counties) with 47,445, or nearly 42 per cent of the state's total. (See Table 12.)

Seventy-three per cent of all the 1957–58 high school graduates in the state came from five State Economic Areas: SEA A (San Francisco–Oakland Metropolitan Area), SEA B (San Jose Metropolitan Area),

California State Economic Areas
(As of July 1959)

Name	Area No.	Counties Included
Standard Metropolitan Statistical Areas		
San Francisco-Oakland Metropolitan Area	A	Alameda, Contra Costa, Marin, San Francisco, San Mateo, Solano
San Jose Metropolitan Area	B	Santa Clara
Sacramento Metropolitan Area	C	Sacramento
Stockton Metropolitan Area	D	San Joaquin
Fresno Metropolitan Area	E	Fresno
Los Angeles-Long Beach Metropolitan Area	F	Los Angeles, Orange
San Diego Metropolitan Area	G	San Diego
San Bernardino-Riverside-Ontario Metropolitan Area	H	San Bernardino, Riverside
Santa Barbara Metropolitan Area	J	Santa Barbara
Bakersfield Metropolitan Area	K	Kern
Nonmetropolitan Areas		
North Coastal Area	1	Del Norte, Humboldt, Lake, Mendocino
North Central Coastal Area	2	Napa, Sonoma
South Central Coastal Area	3	Monterey, San Benito, San Luis Obispo, Santa Cruz
Sacramento Valley Area	4	Butte, Colusa, Glenn, Sutter, Tehama, Yolo, Yuba
North San Joaquin Valley Area	5	Merced, Stanislaus
South San Joaquin Valley Area	6	Kings, Madera, Tulare
South Coastal Area	7	Ventura
Imperial Valley Area	8	Imperial
Sierra Area	9	Alpine, Amador, Calaveras, El Dorado, Inyo, Lassen, Mariposa, Modoc, Mono, Nevada, Placer, Plumas, Shasta, Sierra, Siskiyou, Trinity, Tuolumne

SEA F (Los Angeles–Long Beach Metropolitan Area), SEA G (San Diego Metropolitan Area), and SEA H (San Bernardino–Riverside–Ontario Metropolitan Area). In fact, most of these graduates came from two geographically small but densely populated regions within these five areas: (See Figure 1, page 46)

1. A triangle extending from the San Fernando Valley east to Redlands and thence south to San Diego, including portions of Los Angeles, Orange, San Bernardino, Riverside, and San Diego Counties.
2. A slender triangle extending northwest from Gilroy to Marin

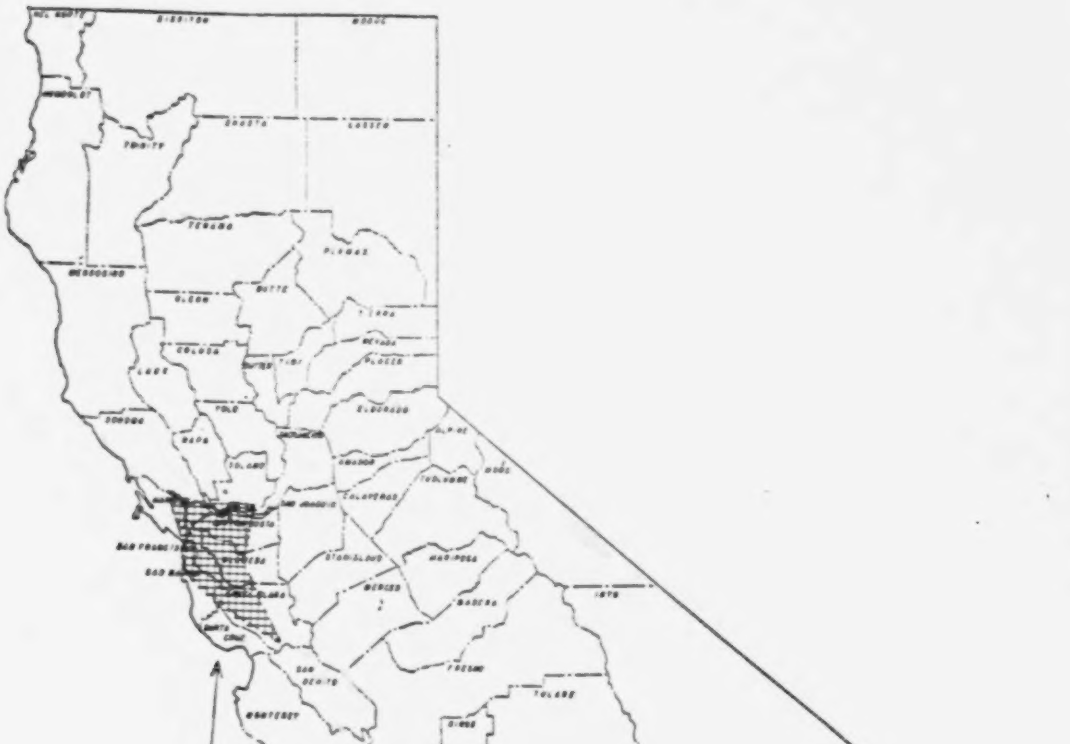
Table 12

Distribution and Increase in Numbers of California Public High School Graduates to 1975, by State Economic Areas

State Economic Area	Actual	Projections for				Percentage of Total 1974-75 High School Graduates	Per Cent Increase of 1974-75 over 1957-58	Number of High School Graduates Per 100 Square Miles in	
	1957-58	1959-60	1964-65	1969-70	1974-75			1957-58	1974-75
Metropolitan									
A. San Francisco-Oakland	19,174	24,050	32,200	37,950	39,450	12.5%	106%	579	1,190
B. San Jose	3,959	5,550	9,750	14,650	21,200	6.7	435	302	1,624
C. Sacramento	3,902	4,450	7,400	9,900	11,600	3.7	197	396	1,178
D. Stockton	1,964	2,400	2,900	3,100	2,850	0.9	45	139	202
E. Fresno	3,338	4,050	4,750	5,600	5,550	1.8	66	56	93
F. Los Angeles-Long Beach	47,445	63,100	89,800	120,000	153,900	48.7	224	978	3,171
G. San Diego	6,622	8,500	13,800	18,900	22,200	7.0	235	155	521
H. San Bernardino-Riverside-Ontario	5,887	7,800	11,250	15,950	22,250	7.0	278	22	81
J. Santa Barbara	987	1,300	1,550	2,100	1,850	0.6	87	36	67
K. Bakersfield	2,743	3,250	3,850	4,300	4,300	1.4	57	34	53
Nonmetropolitan									
1. North Coastal	1,694	2,100	2,650	3,300	3,500	1.1	107	18	37
2. North Central Coastal	1,603	2,200	[illegible],050	3,700	4,250	1.3	165	68	179
3. South Central Coastal	2,429	3,000	4,050	4,800	5,300	1.7	118	29	[illegible]2
4. Sacramento Valley	2,484	3,150	3,700	4,000	4,200	1.3	69	26	45
5. North San Joaquin Valley	2,414	2,800	3,300	3,500	3,450	1.1	43	69	99
6. South San Joaquin Valley	2,502	2,750	2,750	2,700	2,300	0.7	−8	30	27
7. South Coastal	1,386	1,700	2,300	2,850	3,150	1.0	127	75	170
8. Imperial Valley	615	650	700	750	750	0.2	22	14	17
9. Sierra Area	2,959	3,600	4,000	4,050	4,000	1.3	35	6	8
Total	114,107	146,400	203,750	262,100	316,050	100	177%	73	202

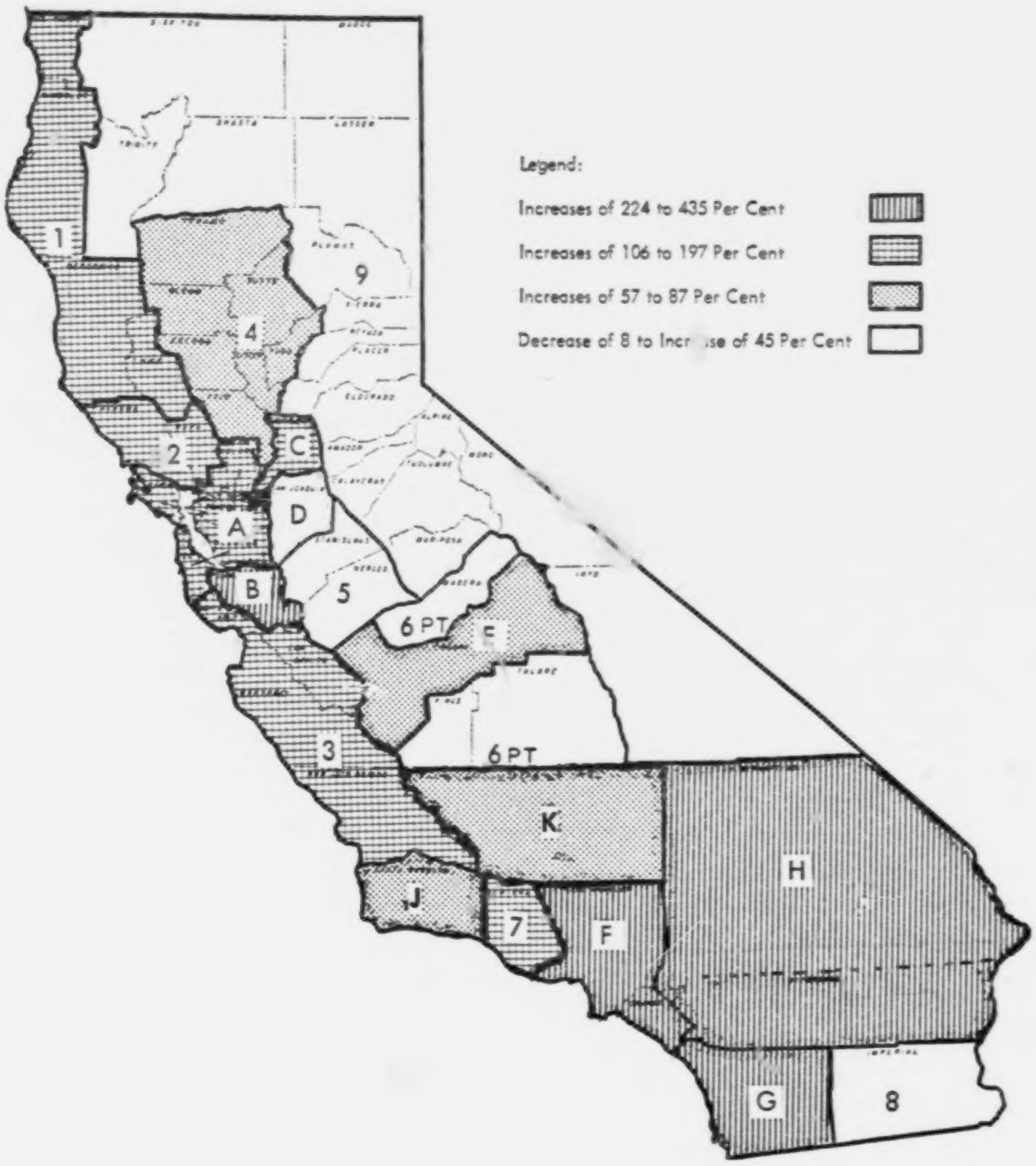
SOURCE: State Department of Finance.

Figure 1
California Regions with Highest Concentrations of Public High School Graduates



Seventy per cent of the State's 1957–1958 public high school graduates came from the two cross-hatched areas and 79 per cent of such graduates in 1975 are expected to come from these two small areas.

Figure 2
Rates of Increase in Public High School Graduates
Projected between 1958 and 1975
Among California State Economic Areas


Legend:
Increases of 224 to 435 Per Cent
Increases of 106 to 197 Per Cent
Increases of 57 to 87 Per Cent
Decrease of 8 to Increase of 45 Per Cent
1
9
4
2
C
A
D
B
5
6 PT
E
3
6 PT
K
H
J
7
F
G
8

County and northeast from Gilroy to Pittsburg, including San Francisco and portions of San Mateo, Santa Clara, Alameda, Contra Costa, Solano, and Marin Counties.

Eighty-seven per cent of all the increase in high school graduates between now and 1975, according to projections, will come from these same five State Economic Areas, which will then include a total of 259,000 graduates, or 82 per cent of the high school graduates of the entire state.

The largest projected rates of increase in public high school graduates will be in SEA B (San Jose Metropolitan Area) where the increase will be 435 per cent, from 3,959 in 1957–58 to 21,200 in 1974–75. (See Table 12 and Figure 2.) Following in order will be: SEA H (San Bernardino–Riverside–Ontario Metropolitan Area) with graduates increasing by 278 per cent, from 5,887 to 22,250; SEA G (San Diego Metropolitan Area) increasing by 235 per cent, from 6,622 to 22,200; SEA F (Los Angeles–Long Beach Metropolitan Area) increasing by 224 per cent, from 47,445 to 153,900; and SEA C (Sacramento Metropolitan Area) increasing by 197 per cent, from 3,902 to 11,600.

Projected increases in numbers of high school graduates are largest in SEA F with 106,455 (almost as large as the current number for the entire state); followed by SEA A with 20,2[illegible], SEA B with 17,241, SEA H with 16,363, and SEA G with 15,578.

The one State Economic Area that it is estimated will have fewer high school graduates in 1974–75 is SEA 6 (Madera, Kings, and Tulare Counties), which, according to projections, will decrease by 16 per cent, from 2,750 in 1957–58 to 2,300 in 1974–75. In fact, high school graduates from the entire San Joaquin Valley—San Joaquin County south to and including Kern County—will increase, according to projections, by only 42 per cent, and from the Sacramento Valley, excluding only the Sacramento metropolitan area, will increase by only 69 per cent. These will be far less than the rate of increase, 177 per cent, for public high school graduates in the entire state.

The rates of increase of all interior areas of California, excepting only metropolitan Sacramento, will be exceeded by those of each coastal State Economic Area, metropolitan or nonmetropolitan, from the Oregon boundary to Mexico.

A county-by-county analysis reveals that, with some slight changes in order, the counties presently having the greatest numbers of high school graduates will also, according to projections, have the most fifteen years from now. Of the ten counties having the most in 1957–58, eight will be among the first ten in 1974–75. These eight counties are: Los Angeles, San Diego, Santa Clara, Orange, San Bernardino, Alameda, Sacramento, and Contra Costa. The other two are San Francisco and Fresno counties. San Francisco County will drop from ninth to twelfth, and Fresno from tenth to eleventh. They will be replaced by San Mateo, rising from eleventh to eighth, and by Riverside, moving from thirteenth to ninth.

Similar facts are revealed when the population density of metropolitan areas is examined. Of the ten counties that in 1957–58 had the greatest numbers of high school graduates per square mile, eight will be among the ten having the largest projected total numbers of graduates in 1974–75. These are: Los Angeles, Alameda, San Mateo, Contra Costa, Orange, Sacramento, Santa Clara, and San Diego. San Francisco, first in number of graduates per square mile in 1957–58, will (because of its extremely small geographical size) be twelfth in total numbers in 1974–75, and Marin County, ninth in number per square mile in 1957–58, will be fourteenth.

The ten counties that will have the largest projected rates of increase in high school graduates between 1957–58 and 1974–75 are, in order: Santa Clara, Orange, San Bernardino, San Mateo, Marin, Riverside, San Diego, Los Angeles, Sacramento, and Monterey.

Significantly, numbers of graduates in the peripheral counties of the two large metropolitan areas (Santa Clara, Marin, and Contra Costa; and Orange, San Bernardino, and Riverside) will increase more rapidly than in counties in the centers of the metropolitan areas—San Francisco, Alameda, and Los Angeles.

Student Capacities Proposed for Junior Colleges, State Colleges, and the University of California

The policy adopted for determining the minimum and maximum student capacities of junior colleges, state colleges, and the University of California has an important bearing on the determination of the numbers of these institutions that will be needed in California by 1975 and beyond. Factors weighed in consideration of enrollment sizes for junior colleges, state colleges, and campuses of the University of California were:

1. The educational objectives of the institution, both functional and geographical.
2. The educational and social welfare of the students, for example:
   a. Opportunity for individual attention from the faculty.
   b. Opportunity for social interchange and organization.
   c. Commuting distance and availability of transportation, parking, etc.
   d. Ability to provide a well-rounded program.

3. Capital outlay and operational costs.
4. Administrative organization.
5. Physical planning, including size of campus site, building heights, etc.

The determination of the sizes proposed as minimum, optimum, and maximum are conclusions arrived at after careful consideration of the pooled judgments of more than one hundred educators in California. Judgments were expressed by administrative officers and faculty members of junior colleges, state colleges, the University of California, and independent colleges and universities. The minimum size proposed in each instance is the size that the Committee believes should be reached by each institution within seven to ten years after it begins to admit students. These are found under "Recommendations" near the end of this section.

The Relative Need for Additional Junior College Facilities

Carefully planned higher education in California must take into account the need for adequate junior college facilities, for in the balanced tripartite system upon which continued excellence in the higher education of this state depends, the junior colleges have a paramount and indispensable role.

To high school graduates not qualified for or not desiring four years of academic instruction beyond high school, the junior college offers two-year terminal occupational training. To those financially unable to attend other institutions of higher education, the junior college offers two years of academic instruction equivalent to that of the lower division in the four-year colleges and universities. To students with scholastic deficiencies preventing immediate admission to senior institutions, the junior college offers a second opportunity to qualify. Furthermore, the junior college provides a wide variety of services to the local community.

Because of the unique educational opportunities provided by the junior colleges and because of the financial inequities created when some areas support them while others do not, additional junior colleges should be established.

The Problem. For several reasons, it is difficult to determine the priority of need for junior colleges in a community by a review of California by State Economic Area. Chief of these is the local character of the junior college, in terms of both control and service. As the Chief of the Bureau of Junior College Education, State Department of Education, has stated in a recent letter:

> . . . Local initiative rather than State directive is responsible for the organization of new and the enlargement of old districts maintaining junior colleges. Any attempt to establish a "priority list" is of little value except to identify areas of need for junior college services. The determination of local citizens and their initiative are the key to the establishment of junior college services.[6]

Because of the relatively small geographic zones of service encompassed by the junior colleges, analysis by State Economic Area is also rendered inadequate, for even when available data for an Area as a whole appear generally favorable, certain communities within it may still be outside the range of effective service of any junior college.

Another difficulty in attempting to establish priorities for junior colleges needed is that there are at least three different kinds of "need": first, need in terms of adequate opportunity for local students; second, need for facilities to alleviate overcrowded state colleges and University of California campuses; and third, need to accomplish the State Department of Education's objective of including every high school district of the state in a junior college district. Each of these calls for a different kind of analysis.

Need for Educational Opportunity. The existence of a local state college or University campus does not insure full educational opportunity to the youth of that community. Four-year colleges and universities do not, and should not, provide the two-year terminal occupational curricula and other unique services offered by junior colleges, wanted and needed by a large proportion of high school graduates. Moreover, since both state colleges and the University of California are selective in admissions, neither fulfills the real educational needs of many young people in the state for lower division academic education. Evidence of this is found in Joint Staff studies of eligibility of public high school graduates for admission to the state's publicly supported institutions of higher education. A study of the scholastic record of 73,679 public high school graduates in 43 California counties showed that 57.1 per cent of these could *not* meet the admission requirements of either the state colleges or the University of California.[7]

One way to measure the relative adequacy of junior college services in the several State Economic Areas (defined earlier in this section) is to relate junior college enrollment to the number of local high school graduates in each. The data indicate several areas in which the ratios of junior college enrollments to public high school graduates are considerably below the average for the entire state and which, therefore, appear inadequately served by junior colleges.

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[6] Letter from Hugh G. Price to the Master Plan Survey Team, dated November 16, 1959.

[7] T. C. Holy and Arthur D. Browne, "A Study of the Eligibility of Graduates of California Public High Schools for Enrollment in California Public Institutions of Higher Learning," *California Schools*. Sacramento, State Department of Education, December 1959, Table 1.

The two State Economic Areas with the lowest 1958 ratios between these two factors are: Area 1 (North Coastal Area), with no junior college enrollments, and Area 4 (Sacramento Valley Area), with 32 junior college enrollments per 100 public high school graduates. Additional junior college facilities are certainly needed in each of these areas. The other areas revealed as relatively deficient in junior college opportunities are, in order of apparent need: Area 8 (Imperial County), Area G (San Diego County), Area 9 (the Sierra Area, seventeen counties), and State Economic Area B (Santa Clara County).

Since nearly all the areas listed above contain well-developed state college and/or University of California facilities, it may be inferred that one of the major reasons for the deficiency of junior college opportunities has been over-reliance on state-provided facilities. Analysis of the relationship between the projected lower division enrollments for 1975 and the funded capacity of existing junior college facilities confirms this inference.

For the state as a whole the current full-time funded capacity of 170,020 for the junior colleges is only 40.6 per cent of the 1975 projected lower division enrollment of 418,250. Even without a diversion of students from the state colleges and the University to the junior colleges, additional junior college facilities must be provided for 76,330 students by 1975. (See Table 5, page 13.) Assuming that 50,000 students will be diverted to the junior colleges, additional capacity would have to be provided for 126,330 junior college students. If these students were all cared for by establishing new junior colleges (each with the recommended optimum enrollment of 3,500) thirty-six new junior colleges would have to be created by 1975.

The very low ratios of junior college capacity to projected lower division enrollment in some of the State Economic Areas indicate insufficient effort to provide locally financed facilities for the lower division needs in these areas. Furthermore, the fact that these areas in practically all cases enjoy local state college and/or University facilities implies that the state is being called upon to provide educational opportunity for lower division students that other parts of the state are supporting mostly by local taxes. The areas demonstrating the greatest need for more junior colleges on the basis of this comparison of junior college capacity and projected lower division enrollments are Area 1 (North

Coastal Area), Area 4 (Sacramento Valley Area), Area B (San Jose Metropolitan Area), and Area G (San Diego Metropolitan Area). These, it should be noted, are areas that also showed great need for additional facilities on the basis of inadequate opportunity as measured by the ratio of junior college enrollments to public high school graduates.

A recent study by the Bureau of Junior College Education of the California State Department of Education appraised the need for additional junior colleges from a different point of view,[4] and reviewed the current situation and future needs county-by-county. The study takes two needs into consideration although these are not completely differentiated. One is the necessity to expand the boundaries of existing districts in order to include as much territory and tax base as possible in a junior college district, and the second is the necessity to expand facilities in order to adequately serve the needs of the student potential. Taking both of these considerations into account, the authors of that report listed twenty-two areas in which actual expansion of facilities for potential junior colleges are warranted. These, with their estimated enrollments in 1975, appear in the recommendations at the end of this section.[5]

Conclusions

The Technical Committee on Institutional Capacities and Area Needs concludes that:

1. If the advantages of California's tripartite system of higher education are to be continued and the maximum educational opportunity provided for the state's educational expenditures, the facilities of existing junior colleges must be greatly expanded and additional institutions provided in areas not now served.
2. Some method should be devised to encourage inclusion of all high school districts within a junior college district. This is necessary both to insure the most opportunity to the greatest number of the young people of the state and to equalize the burden for the support of lower division education throughout the state.
3. State financial assistance should be provided for the construction of junior college facilities. This assistance would aid both the creation of new junior college districts and the expansion of the facilities of

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[4] *The Public Junior College System: The Current Situation and Future Needs.* Sacramento, State Department of Education, Bureau of Junior College Education and Bureau of School District Organization, November 16, 1959.

[5] See *California's Public Junior Colleges.* Sacramento, State Department of Education Bulletin, February 1958, for more information on the origin, scope, functions, and operation of California's public junior colleges.

existing districts. Moreover, the creation of additional junior college facilities will help to alleviate the pressure on fully state-supported facilities and, in the long run, probably cost the state less than building additional state college and University facilities.

4. Fully adequate junior college facilities should be provided in any area prior to the establishment of state college or University of California facilities, and junior college facilities should be expanded in those areas where the evidence indicates need. (See list of such areas in the recommendations later in this section.)

The Relative Need for New State Colleges and Campuses of the University of California

The Committee's consideration and study of the needs for new state colleges and new campuses of the University of California is based on the assumption that these institutions, when established, will be located in the population centers with the largest potential enrollment.[10]

Possible New State Colleges. Four new state colleges were authorized by the 1957 Legislature, but two of those have not yet been located. One of these is in State Economic Area 2 (North Central Coastal Area), the other in State Economic Area 5 (North San Joaquin Valley Area). The Technical Committee on Institutional Capacities and Area Needs urges that these state colleges be located and constructed without delay. Table 13 shows not only the enrollment projections for these newly authorized state colleges, but for the others as well for certain years up to 1975.

The Committee suggests that the site for the state college to be located in SEA 2 be selected in the vicinity of Petaluma in accordance with Principle 5 quoted in the footnote. The commuting distance from Contra Costa County to the Petaluma area is a reasonable one; it is therefore suggested that careful consideration be given to the transportation of students from Contra Costa County to the new college in the Petaluma area by bus at actual cost and that bridge toll be waived to students crossing the bridge when attending or returning from the college in the Petaluma area.

The Committee believes that the site for the new state college authorized for State Economic Area 5 should be selected in the Salida Area in Stanislaus County. This suggested site is near the county line north of

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[10] This is in accord with Principle 5 on p. vi of *A Study of the Need for Additional Centers of Public Higher Education in California*, as approved by the two governing boards, which states: "In order that a possible new institution may serve the greatest number of eligible students it should be *placed near the center of the population served by it.*"

Modesto. Stanislaus is a small county geographically, and a state college located between Salida on the north boundary and Turlock on the south (the two cities being about nineteen miles apart) would serve all students within commuting distance in the county. The Committee submits that county lines should be disregarded when a state college site is selected and that selection be made of the site that will best serve the largest number of potential students.[11]

Table 13

Projections of Full-Time Student Enrollments to 1975 of Existing and Authorized California State Colleges

College	Existing or Authorized	SLA	Fall 1958	Fall 1965	Fall 1970	Fall 1975
San Francisco........	Existing	A	5,250	6,550	7,700	8,200
Alameda County......	Existing	A	.....	1,500	5,250	8,050
San Jose..............	Existing	B	9,035	14,500	19,800	24,900
Sacramento...........	Existing	C	2,709	4,550	6,100	7,250
Fresno................	Existing	E	4,358	6,400	8,100	8,500
Los Angeles...........	Existing	F	3,334	14,100	22,400	28,550
Long Beach..........	Existing	F	4,380	14,250	19,450	24,850
San Fernando.........	Existing	F	987	9,000	14,050	18,100
California Polytechnic (Kellogg-Voorhis)..	Existing	F	1,101	5,450	10,500	15,700
Orange County.......	Existing	F	.....	2,900	6,500	9,900
San Diego............	Existing	G	5,573	11,300	15,650	20,150
Humboldt...........	Existing	1	1,397	2,450	3,400	4,300
North Bay............	Authorized	2	.....	450	1,650	2,500
California Polytechnic (San Luis Obispo)...	Existing	3	3,796	6,950	9,550	11,050
Chico................	Existing	4	2,608	4,050	5,300	5,650
Stanislaus............	Authorized	5	.....	550	1,750	2,350
Total............	....	...	44,528	104,950	157,150	200,000

SOURCE: State Department of Finance.

In 1957–58, Stanislaus County had 1,603 high school graduates; San Joaquin County to the north had 1,964; Merced County to the south had 811. In 1974–75 it is estimated that Stanislaus will have 2,200 graduates, San Joaquin 2,850, and Merced, 1,250. Stockton, twenty-one miles north of the Stanislaus County line, has a population of 89,000. Merced, the only sizeable city in Merced County, twenty-five miles south of the

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[11] Since this report was written, the state college in Stanislaus County has been located near Turlock, and the one to serve the North Bay Area has been located near Cotati in Sonoma County.

Stanislaus County line, has a population of 21,650. The Committee concludes that the location of this new college in the vicinity of Salida is in accordance with Principle 5 of the *Additional Centers* study.

The projections and data clearly indicate that an additional state college is needed in State Economic Area F (Los Angeles–Long Beach Metropolitan Area), and another in State Economic Area H (San Bernardino–Riverside–Ontario Metropolitan Area). (See Appendix I.) The Committee proposes that the site for the state college to be located in SEA F be selected in the vicinity of the Los Angeles International Airport and that the state college site in SEA H be selected in the vicinity of Rialto in San Bernardino County.

The recommendation of this Committee on student capacity, which appears on page 69, is that the size for state colleges in densely populated metropolitan centers be: minimum, 5,000; optimum, 10,000; maximum, 20,000. The estimated 1975 full-time enrollment potential for Long Beach State College, with the establishment of the newly proposed state college, is 18,600.

The estimated 1975 full-time enrollment potential for a new state college to be located in the vicinity of the Los Angeles International Airport is 19,900. Thus it seems that:

1. There can be no question concerning the necessity for an additional state college in the area suggested.

2. If and when the physical facilities of Long Beach State College are developed for the accommodation of from 18,000 to 20,000 students and a new state college is constructed in the vicinity of the Los Angeles International Airport, the western section of SEA F will be adequately serviced by state colleges.

In this connection, it is pointed out that the estimated 1975 full-time enrollment potential for the San Fernando Valley State College is 18,100. The Committee believes that physical facilities should be provided for an enrollment of from 18,000 to 20,000 students at this institution. (See Figure 3, which shows the relative locations of the state colleges to serve this area of the state.)

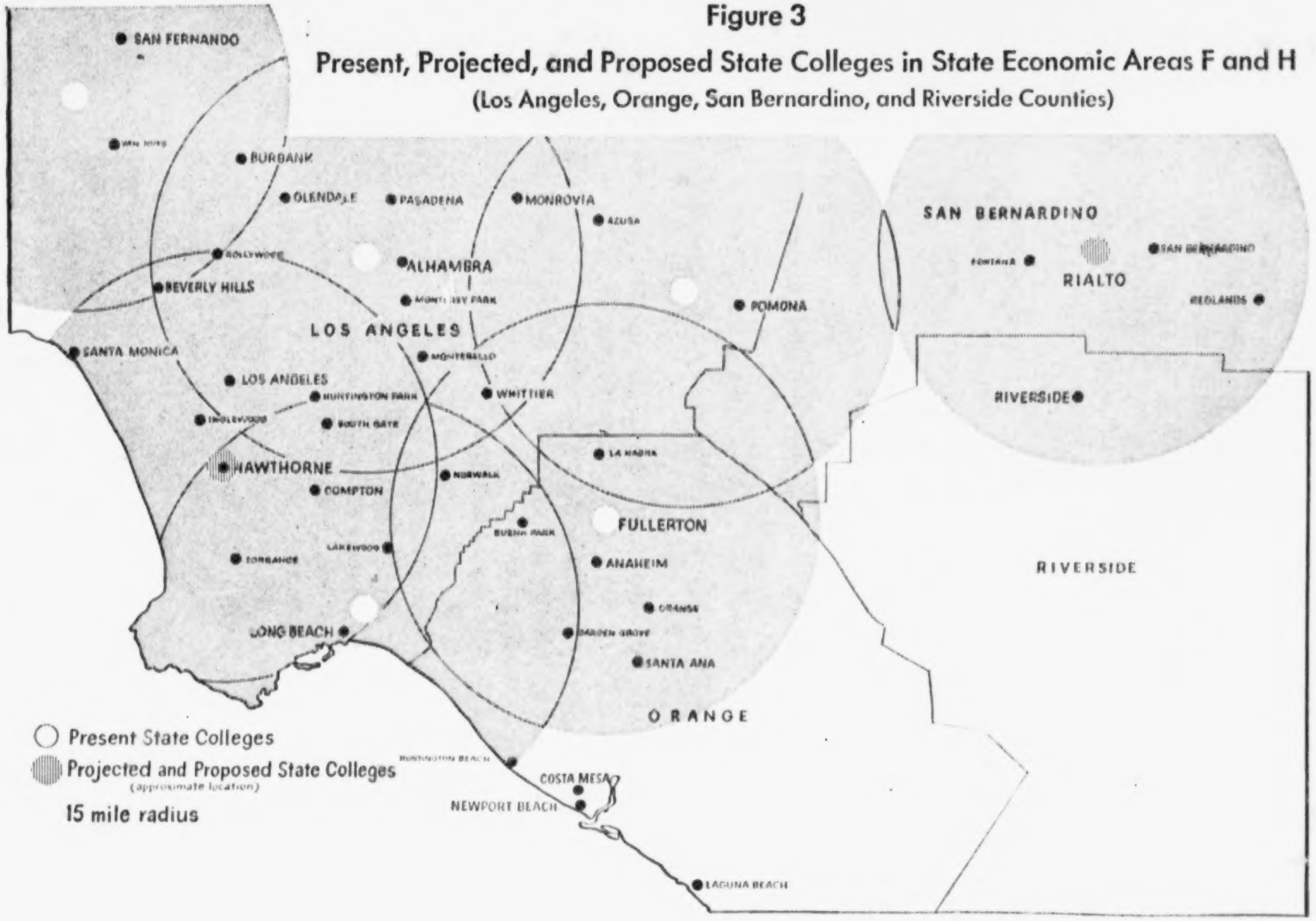
Enrollment projections and data pertinent to this issue reveal clearly that a state college is needed in State Economic Area H (San Bernardino–Riverside–Ontario Metropolitan Area). The estimated 1975 full-time enrollment potential for a state college in this area is 12,800. It will be noted that the Committee has suggested earlier that the site for this new state college be selected in the Rialto area.

It is pointed out that this State Economic Area is serviced by Chaffey Junior College at Ontario, San Bernardino Valley College, Riverside City College, Palo Verde College at Blythe, and Coachella Valley Col-

Figure 3

Present, Projected, and Proposed State Colleges in State Economic Areas F and H

(Los Angeles, Orange, San Bernardino, and Riverside Counties)


SAN FERNANDO
VAN NUYS
BURBANK
GLENDALE
PASADENA
MONROVIA
AZUSA
HOLLYWOOD
BEVERLY HILLS
ALHAMBRA
MONTEREY PARK
LOS ANGELES
SANTA MONICA
MONTEBELLO
LOS ANGELES
HUNTINGTON PARK
WHITTIER
INGLEWOOD
SOUTH GATE
HAWTHORNE
NORWALK
COMPTON
BUENA PARK
LAKEWOOD
TORRANCE
LONG BEACH
POMONA
LA HABRA
FULLERTON
ANAHEIM
ORANGE
GARDEN GROVE
SANTA ANA
ORANGE
HUNTINGTON BEACH
COSTA MESA
NEWPORT BEACH
LAGUNA BEACH
SAN BERNARDINO
FONTANA
RIALTO
SAN BERNARDINO
REDLANDS
RIVERSIDE
RIVERSIDE
○ Present State Colleges
▨ Projected and Proposed State Colleges (approximate location)
15 mile radius

lege. In addition to these, a junior college has been authorized and bonds voted for its construction at Barstow, and a study is being made of the need for a junior college in the Victor Union High School District. On the other hand, only one state institution of higher education, the University of California at Riverside, is located in this area.

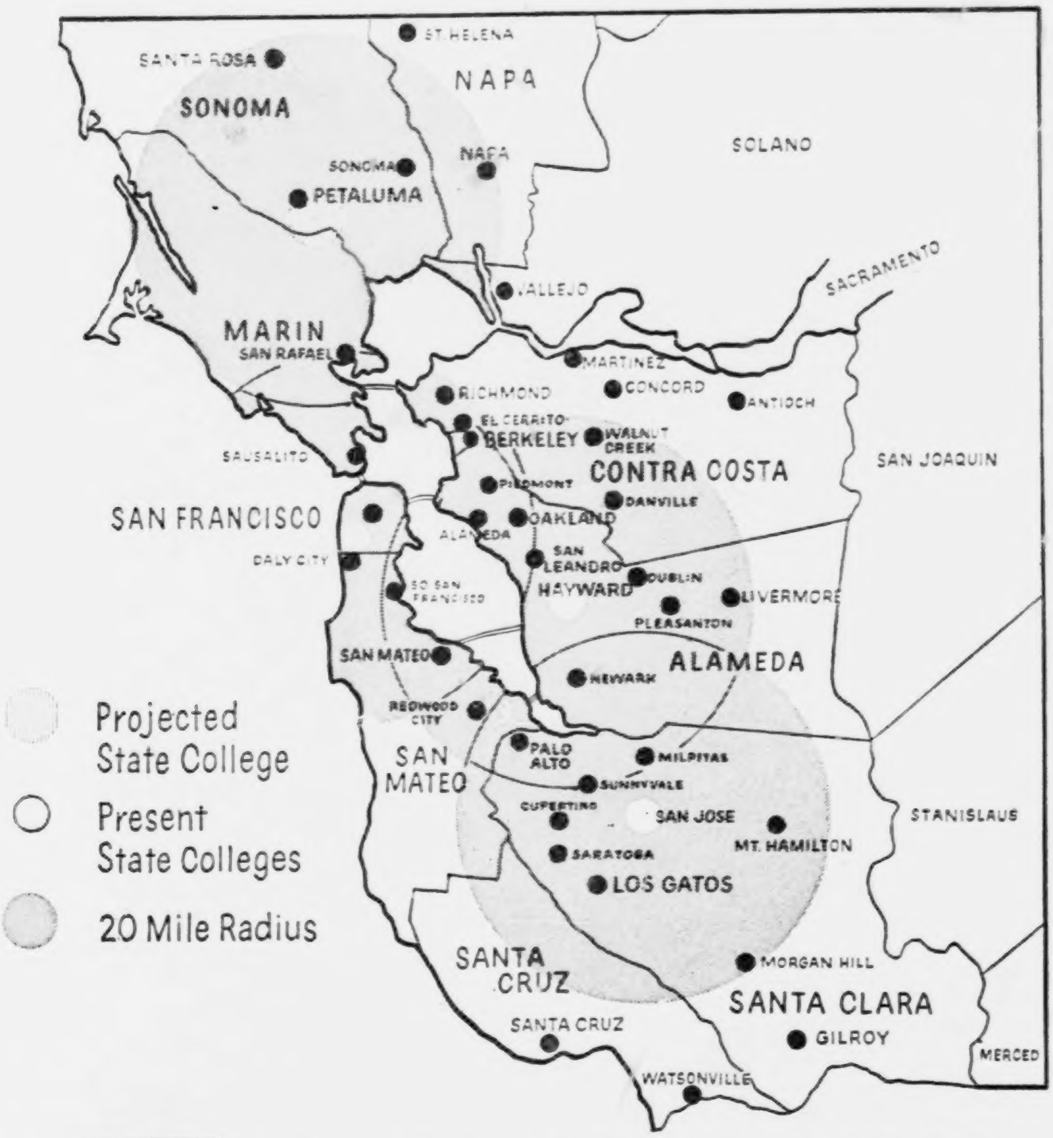
Review of State Economic Areas in 1965 and 1970. The Committee recommends that the following State Economic Areas be reviewed in 1965 and again in 1970, where applicable, to determine the actual need at the time for state colleges:

1. *SEA A (San Francisco–Oakland Metropolitan Area), Contra Costa County.* The estimated 1975 enrollment potential for a possible state college in Contra Costa County is 4,200 students (see Appendix I). It is probable that this potential will be decreased by the establishment of a new state college in the Petaluma area of Sonoma County (see Figure 4). As was noted previously, the commuting distance is not unreasonable and the Committee has urged that special consideration be given to students from Contra Costa County who will be attending the state college in the Petaluma area.

2. *SEA A (San Francisco–Oakland Metropolitan Area), Redwood City Area.* The estimated 1975 full-time enrollment potential for a state college in SEA A in the vicinity of Redwood City is 10,500 (see Appendix I). The 1975 estimated full-time enrollment at San Francisco State College is 8,200 students without new state colleges, and the estimated 1975 enrollment, as modified by the influence of the establishment of other state colleges, primarily one in the Redwood City area, is 6,000 students. Thus, it is believed that a new state college located in the Redwood City area would take some 1,500 to 2,000 students from San Francisco State College. The Committee is of the belief that consideration should be given to building up San Francisco State College and increasing its physical plant capacity so as to accommodate 12,000 or more students. This seems to be sound educationally as well as fiscally.

A check of actual travel time from the main population centers in San Mateo County to San Francisco State College showed that all of these centers were within forty-five minutes or less travel time to that campus (seven being within twenty-five minutes or less). According to population estimates by the Department of Public Works, these centers had an estimated population of 297,418 on July 1, 1958, or 74.5 per cent of the total for the county. Since some portion of the remaining population in the county is within forty-five minutes travel time to San Francisco State College, more than three-fourths of the county's total population is within forty-five minutes travel time of San Francisco State College. Actual travel time was also checked from all these population

Figure 4
Present and Projected State Colleges in
State Economic Areas A, B, and 2
(San Francisco, Alameda, Contra Costa, Solano, Marin,
Sonoma, Napa, and Santa Clara Counties)*


ST. HELENA
SANTA ROSA
SONOMA
NAPA
SOLANO
SONOMA
NAPA
PETALUMA
SACRAMENTO
VALLEJO
MARIN
SAN RAFAEL
MARTINEZ
RICHMOND
CONCORD
ANTIOCH
EL CERRITO
BERKELEY
WALNUT CREEK
SAUSALITO
SAN JOAQUIN
PIEDMONT
CONTRA COSTA
SAN FRANCISCO
OAKLAND
DANVILLE
ALAMEDA
DALY CITY
SAN LEANDRO
DUBLIN
SO SAN FRANCISCO
HAYWARD
LIVERMORE
PLEASANTON
SAN MATEO
ALAMEDA
NEWARK
REDWOOD CITY
Projected State College
PALO ALTO
MILPITAS
SAN MATEO
Present State Colleges
SUNNYVALE
CUPERTINO
SAN JOSE
MT. HAMILTON
STANISLAUS
SARATOGA
20 Mile Radius
LOS GATOS
SANTA CRUZ
MORGAN HILL
SANTA CLARA
SANTA CRUZ
GILROY
MERCED
WATSONVILLE

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* The reason for the use of 15-mile radii in Figure 3 and 20-mile radii in Figure 4 is that there is greater traffic congestion in the Los Angeles Area and as a consequence travel is slower there than in the San Francisco Bay Area.

centers (with the exception of the very northernmost cities) to San Jose State College and it was found that all were within sixty minutes or less and that five were within forty minutes or less.[12] (See Figure 4.)

Furthermore, a new campus of the University of California has been authorized for the South Central Coastal Area (San Mateo–Santa Clara–Santa Cruz–San Benito–Monterey Counties). It is believed that the establishment of this campus will in part provide educational opportunities for the estimated 1975 full-time enrollment potential for a state college in the Redwood City area of SEA A.

The Alameda County State College was established in Hayward in the fall of 1958. The campus and physical facilities are yet to be developed. It is reasonable to assume, however, that when this state college is developed it will reduce the enrollment potential for a state college in the Redwood City area. By using the San Mateo Bridge, some of the most densely populated sections of San Mateo County are within commuting range of the Alameda County State College.

Junior college facilities in San Mateo County should also be expanded. There are indications that this will be done. Expansion of junior colleges would diminish in part the potential enrollment for a state college in the Redwood City area. The Committee concludes that the Redwood City area of SEA A should be studied in 1965 and again in 1970, if applicable, to determine the actual need for a new state college in this area.

3. *SEA B (San Jose Metropolitan Area), Santa Clara County.* This area has an estimated 1975 full-time enrollment potential of 24,900 students. The Committee believes that the physical facilities of San Jose State College should be increased to care for a greater number of students—this in accordance with the Committee's recommendation relative to sizes of state colleges.

This locale should be studied in 1965 and again in 1970, if applicable, to see what effect new state colleges established in the San Francisco Bay Area, additional junior colleges, and a new campus of the University of California in the South Central Coastal Area have on the enrollment of San Jose State College and determination made as to the actual need for additional state college facilities in this area.

4. *SEA F (Los Angeles–Long Beach Metropolitan Area).* The estimated 1975 full-time enrollment potential for a possible new state college in this area in the vicinity of Glendale–Griffith Park is 12,600 (see

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[12] Joint Staff for the Liaison Committee of the California State Board of Education and The Regents of the University of California, *A Study of the Need for Additional Centers of Higher Education in San Mateo, Monterey, San Benito, and Santa Cruz Counties.* Sacramento and Berkeley, December 1958, p. 37.

Appendix I). It is pointed out that this vicinity of SEA F is not adequately serviced by junior colleges. Junior college facilities are needed in Burbank and perhaps in other communities within a fifteen-mile radius of the Glendale–Griffith Park area.

It is believed that the provision of adequate junior college facilities for the area, the expansion of the physical plants at Long Beach State College and San Fernando Valley State College, the establishment of a new state college in the vicinity of Los Angeles International Airport, and the construction and development of a new campus of the University of California in the Southeast Los Angeles–Orange County area will diminish the potential enrollment for a second new state college in this area perhaps to the point where there will be no real need for one (see Figure 3).

Therefore, the Committee recommends that this area be studied in 1965 and again in 1970, if applicable, to determine the actual need for a new state college in this area.

5. *SEA G (San Diego Metropolitan Area).* It is recommended that study be made of this area in 1965 and again in 1970, if applicable, to determine the effect of addition and expansion of junior college facilities and a general campus of the University of California in the San Diego–La Jolla area on the estimated 1975 full-time enrollment potential of San Diego State College; and whether there is actual need for a new state college in this State Economic Area.

6. *SEA 7 (South Coastal Area), Ventura, SEA 3 (South Central Coastal Area), Monterey, San Benito, San Luis Obispo, Santa Cruz Counties, SEA D (Stockton Metropolitan Area), and SEA 2 (North Central Coastal Area), Napa–Sonoma.* It is recommended that these areas be studied in 1970 to determine actual need and full-time enrollment potentials of state colleges which might possibly be needed in each area. (See Appendix I.)

The Need for New Campuses of the University of California. Table 14 shows the 1958 full-time enrollment at the existing campuses of the University of California and the 1975 estimates for both existing and authorized campuses.

The potential enrollment for a campus of the University of California in the Southeast Los Angeles–Orange County area as authorized by the Regents in 1957 indicates clearly that an "Eastwood" campus of the University of California should be located in the western section of the Puente Hills in the Whittier area. This suggested site is confirmed by studies of the total population of the area, by projected high school graduates, by population growth trends, and by transportation arteries.

1. *The Berkeley Campus of the University of California.* The estimated enrollment potential for the University of California, Berkeley campus, in 1975 is 43,950 students. The Committee believes that the maximum size of a campus of the University of California should not exceed 27,500. Therefore, it is apparent that approximately 16,000 potential students for the Berkeley campus may have to be accommodated elsewhere in 1975. The Committee proposes that the Davis campus be developed to accommodate an enrollment of about 15,000. It is also believed that a portion of the 16,000 students referred to above might well be accommodated by other new campuses of the University of California, particularly the one that was authorized by the Regents in 1957 (see Figure 5) in State Economic Area B. The remaining part of the difference might be accommodated through the establishment of branch installations from existing campuses in specialized fields of study, such as instruction in science at Livermore. (These would be similar to the off-campus centers for teacher education now operated by certain of the state colleges.)

Table 14

Projections of Full-Time Student Enrollments in 1975 of
Existing and Authorized Campuses of the University of California

Campus	Existing or Authorized	1958	1975
Berkeley	Existing	19,198	43,950
Los Angeles	Existing	16,274	35,600
Davis	Existing	2,341	7,750
Riverside	Existing	991	7,050
Santa Barbara	Existing	2,710	9,900
San Francisco	Existing	1,534	2,600
Southeast Los Angeles-Orange	Authorized	.....	16,950
La Jolla	Existing and Authorized Expansion	53	3,650
South Central Coast	Authorized	.....	8,550
Total	....	43,101	136,000

2. *The Los Angeles Campus of the University of California.* The projected University of California enrollment for the Los Angeles–Long Beach Metropolitan Area in 1975 is 52,550 students. If this projection is realized, there would be approximately 25,000 potential students for UCLA to be accommodated elsewhere. Of these, the new "Eastwood" campus of the University in the western section of the Puente Hills in

Figure 5
Present and Projected University of California Campuses in
State Economic Areas A, B, and 2
(San Francisco, Alameda, Contra Costa, Solano, Marin,
Sonoma, Napa, and Santa Clara Counties)

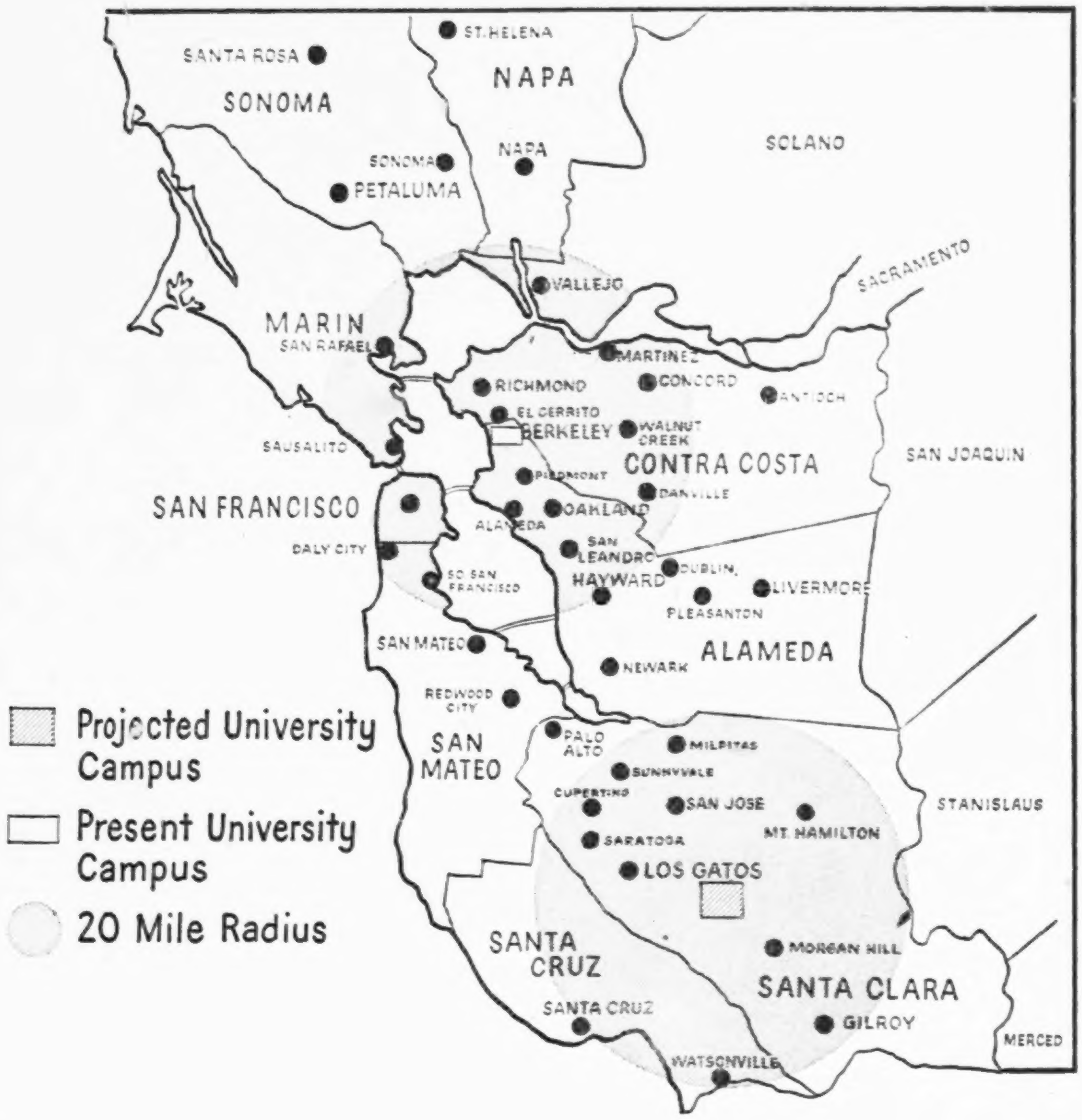
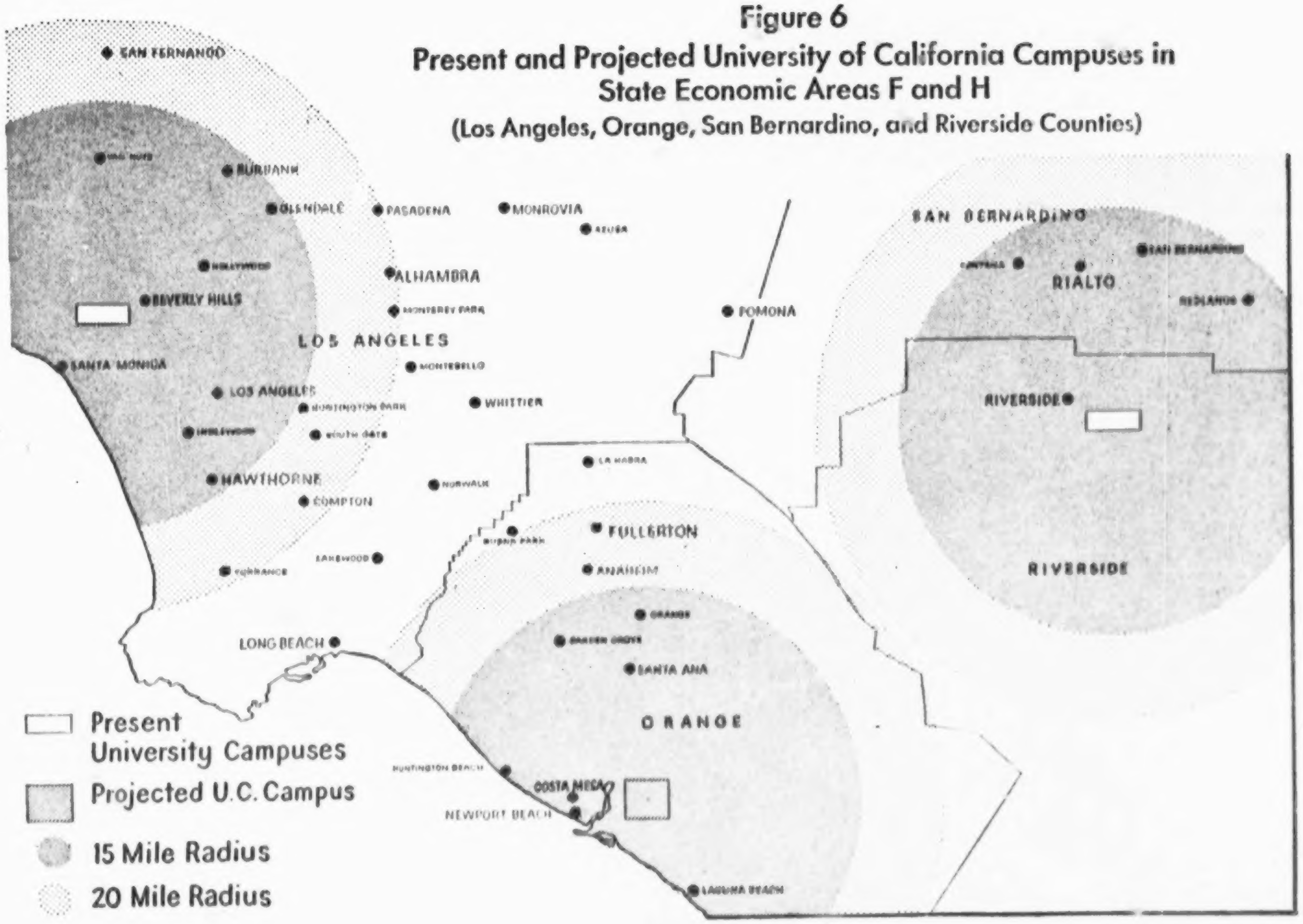

ST. HELENA
SANTA ROSA
NAPA
SONOMA
SOLANO
NAPA
SONOMA
PETALUMA
SACRAMENTO
VALLEJO
MARIN
SAN RAFAEL
MARTINEZ
CONCORD
ANTIOCH
RICHMOND
EL CERRITO
BERKELEY
WALNUT CREEK
SAN JOAQUIN
SAUSALITO
CONTRA COSTA
PIEDMONT
DANVILLE
SAN FRANCISCO
OAKLAND
ALAMEDA
DALY CITY
SAN LEANDRO
DUBLIN
SO. SAN FRANCISCO
HAYWARD
LIVERMORE
PLEASANTON
SAN MATEO
NEWARK
ALAMEDA
REDWOOD CITY
PALO ALTO
MILPITAS
SAN MATEO
SUNNYVALE
CUPERTINO
SAN JOSE
STANISLAUS
MT. HAMILTON
SARATOGA
LOS GATOS
SANTA CRUZ
MORGAN HILL
SANTA CLARA
SANTA CRUZ
GILROY
MERCED
WATSONVILLE
Projected University Campus
Present University Campus
20 Mile Radius

Figure 6

Present and Projected University of California Campuses in State Economic Areas F and H

(Los Angeles, Orange, San Bernardino, and Riverside Counties)


SAN FERNANDO
BURBANK
GLENDALE
PASADENA
MONROVIA
AZUSA
ALHAMBRA
BEVERLY HILLS
MONTEREY PARK
LOS ANGELES
SANTA MONICA
MONTEBELLO
LOS ANGELES
HUNTINGTON PARK
WHITTIER
SOUTH GATE
HAWTHORNE
NORWALK
COMPTON
LA HABRA
BUENA PARK
FULLERTON
LAKEWOOD
TORRANCE
ANAHEIM
LONG BEACH
ORANGE
GARDEN GROVE
SANTA ANA
ORANGE
HUNTINGTON BEACH
COSTA MESA
NEWPORT BEACH
LAGUNA BEACH
POMONA
SAN BERNARDINO
SAN BERNARDINO
RIALTO
REDLANDS
RIVERSIDE
RIVERSIDE
Present University Campuses
Projected U.C. Campus
15 Mile Radius
20 Mile Radius

the Whittier area[13] might accommodate 15,000, and the other campuses in Southern California might be expected to accommodate a large portion of the remainder.

The Committee believes that in 1965 and again in 1970, if applicable, careful study should be made of the need for additional University facilities in the San Joaquin Valley (in October, 1957, The Regents approved a recommendation that further study "be given to the establishment of a campus in the San Joaquin Valley") and the Los Angeles area. In the Los Angeles area special consideration should be given to the following:

1. The extent to which the difference between the 1975 estimates of potential University enrollment and the maximum capacity at UCLA can be cared for by the new Southeast Los Angeles–Orange County campus.

2. The extent to which some of these potential students may be diverted to the campuses at La Jolla, Riverside, and Santa Barbara.

3. The establishment of branch installations in specialized fields of study from existing campuses in this area similar to those mentioned above in connection with the Berkeley campus.

Major Findings

1. More than one million students will enroll in California institutions of higher education in 1975, and of these 661,000 will be full-time students (includes special students). This is nearly triple the current enrollment.

2. Graduates from California high schools, public and private, will increase by 176 per cent, from 123,807 in 1957–58 to 341,350 in 1974–75; those from public high schools only will increase by 177 per cent, from 114,107 to 316,050.

3. By 1975 full-time freshman enrollments in the junior colleges will increase by 171 per cent; in the state colleges, by 330 per cent; in the University of California, by 227 per cent; in the independent colleges and universities, by 65 per cent.

4. By 1975:

a. Lower division enrollments will increase 176 per cent in the junior colleges, 358 per cent in the state colleges, and 227 per cent in the University of California, and 65 per cent in the independent colleges and universities.

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[13] Since this report was written, The Regents of the University of California have accepted as a site for this new campus to serve Southeast Los Angeles–Orange Counties 1,000 acres from the Irvine Ranch, located south of Santa Ana and northeast of Newport Beach. At the same time they accepted as a gift from the city of San Diego 450 acres of land for the La Jolla campus. See Figure 6, which shows the Los Angeles area.

b. Upper division enrollments will increase 344 per cent in the state colleges, 212 per cent in the University of California, and 49 per cent in the independent colleges and universities.

c. Graduate enrollments will increase 346 per cent in the state colleges, 207 per cent in the University of California, and 72 per cent in the independent colleges and universities.

5. State college projected awards of the master's degree will increase by 301 per cent, from 1,688 in 1958–59 to 6,775 in 1975–76; University of California awards by 294 per cent, from 1,820 to 7,175; and in the independent colleges and universities by 113 per cent, from 2,328 to 4,950.

6. Master's degree awards by California institutions are estimated to increase by 224 per cent between 1959 and 1975 and doctoral degrees by 290 per cent (from 865 in 1958–59 to 3,375 in 1975–76). This increase at the doctoral level is estimated at 125 per cent in the private institutions and 444 per cent in the University of California.

7. Seventy per cent of all the 1957–58 public high school graduates of the state came from two small areas as follows (see Figure 1):

a. A triangle extending from the San Fernando Valley east to Redlands and thence south to San Diego (including portions of Los Angeles, Orange, San Bernardino, Riverside, and San Diego Counties).

b. A slender triangle extending from Gilroy northwest to Marin County, and (again from Gilroy) north to Pittsburg (including San Francisco and portions of Marin, Solano, Contra Costa, Alameda, Santa Clara, and San Mateo Counties).

Furthermore, seventy-nine per cent of all the projected public high school graduates in 1975 will come from these two small areas.

8. In numbers of public high school graduates by 1975, increases over 1957–58 will be largest in SEA F (Los Angeles–Long Beach Metropolitan Area) with 106,455 (*added* to its current total, 47,445), followed by SEA A (San Francisco–Oakland Metropolitan Area) with 20,276, and by SEA G (San Diego) with 15,578.

9. The ten counties that will have the largest projected rates of increase in public high school graduates between 1957–58 and 1974–75 are, in order: Santa Clara, Orange, San Bernardino, San Mateo, Marin, Riverside, San Diego, Los Angeles, Sacramento, and Monterey.

10. Even without any planned diversion of students from the state colleges and the University of California to the junior colleges, additional junior college facilities will be needed for 76,330 students before

1975, an increase of 44.9 per cent over existing and currently funded capacity.

11. The average experience, during the most recent two years, of six existing state colleges with regard to the rates of attendance of students living at varying distances from the institutions, when used to estimate the enrollments of possible state colleges in a number of assumed locations, results in the following projections of 1975 enrollments: (See Appendix I for explanation of methods used in deriving the figures that follow in both this item and in item 12 that immediately follows.)

Assumed Location	SEA	1975 College Enrollment
Los Angeles International Airport Area	F	19,900
San Bernardino-Riverside Area	H	12,800
Griffith Park-Glendale Area	F	12,600
Redwood City Area	A	10,500
Walnut Creek-Franklin Canyon Area	A	4,700
Bakersfield Area	K	3,100
Castroville (Monterey Bay) Area	3	2,900
Ventura-Oxnard Area	7	2,800
Stockton Area	D	2,200
Napa-Vallejo Area	2	2,100

12. The combined effect of two new state colleges in the Los Angeles area upon the enrollments of presently existing and authorized institutions would be:

State College	Full-Time 1975 Enrollments	
	With Existing State Colleges	With Certain New State Colleges
San Fernando State College	18,100	9,800
Los Angeles State College	28,550	15,900
Long Beach State College	24,850	18,600
California Polytechnic (Kellogg-Voorhis)	15,700	11,100
Orange County State College	9,900	9,900
New College: Southwest Los Angeles	......	19,900
New College: Glendale	......	12,600
Total	97,100	97,800

13. The current rate of attendance of San Bernardino County high school graduates at the various state colleges is low (there are but twenty-two state college freshmen per 1,000 high school graduates from this county, compared with sixty-seven per 1,000 graduates from all California high schools), indicating that to create a new state college in this area would only slightly affect the enrollments of other state colleges and would offer opportunity to a large number of students who otherwise would not secure a college education.

14. Enrollments in a state college located in San Mateo County would be secured largely by diverting them from other local state colleges.

15. Fifty-two per cent of San Jose State College's first-time freshmen come from outside Santa Clara and San Mateo Counties.

16. The three new campuses authorized by The Regents of the University of California are to be located in the areas of the four counties of the state that in 1975 will have the largest numbers of public high school graduates. By that date, these counties (Los Angeles, San Diego, Orange, and Santa Clara) will include 62 per cent of all high school graduates of the state.

Conclusions

1. Since over-all enrollments of both the state colleges and the University of California will increase more rapidly than those of the junior colleges, and also more rapidly than will high school enrollments, limitations of lower division enrollments that are pegged to total institutional enrollments or to upper division enrollments will not divert sizeable numbers to the junior colleges. The only controls that will accomplish this must be directly related to the rate of increase in public high school graduates.

2. If the advantages of California's tripartite system of higher education are to be continued and maximum educational opportunity provided by the state's educational expenditures, the facilities of existing junior colleges must be greatly expanded and additional institutions provided in areas not now served.

3. To permit both San Francisco State College and Alameda County State College to grow toward their presently projected enrollments would be more economical than to create at this time a new college in the same commuting area (San Mateo County).

4. Since more than half of San Jose State College's students come from outside Santa Clara or San Mateo Counties, a more economical solution than the creation of another college in the same commuting area would be to reduce some of the student overflow by diverting it

to the relatively small state colleges in San Francisco, Alameda County, Stanislaus County, and the North Bay Counties.

5. It would be impractical to develop sufficient capacity on the Berkeley and Los Angeles campuses of the University of California to accommodate the enrollments projected for 1975. Therefore, new campuses to care for a part of these projected enrollments should be developed without further delay.

6. If students meeting the admission requirements of the University of California and seeking to enroll at the Berkeley and Los Angeles campuses are not to be denied opportunity to attend the University, provision must be made for them on other campuses of the University.

7. The San Diego–La Jolla campus should be planned as a general University campus, rather than one with only specialized and limited functions.

8. Only if all authorities proceed immediately with a pervading spirit of urgency will sufficient junior colleges, state colleges and University of California facilities be developed to meet the needs of the students of the state.

Recommendations

The Technical Committee on Institutional Capacities and Area Needs recommends that:

1. *The following range of full-time enrollments be observed for existing institutions, for those authorized but not yet established, and for those later established:*

Type of Institution	Minimum[1]	Optimum	Maximum
Junior Colleges	400	3,500	6,000[2]
State Colleges			
In Densely Populated Areas in Metropolitan Centers	5,000	10,000	20,000
Outside Metropolitan Centers	3,000	8,000	12,000
University of California	5,000[3]	12,500	27,500

[1] To be attained within seven to ten years after students are first admitted.
[2] In densely populated areas in metropolitan centers this maximum could be larger.
[3] This minimum figure assumes graduate work in basic disciplines and one or more professional schools.

2. *The state give encouragement to making junior college facilities available in the school districts not now adequately serviced either through the establishment of new junior colleges or by making them a part of districts now serviced by junior colleges. Evidence at hand indi-*

cates that there is need for new junior colleges in the following school districts:

School Districts to Be Included	County	1975 Full-Time Enrollment[1]
San Diego City (Additional Campuses)	San Diego	6,500
City of Los Angeles (Additional Campus)	Los Angeles	6,000
Alhambra, El Monte, Montebello	Los Angeles	5,000
Hayward, San Leandro, Washington Union High School Districts	Alameda	5,000
Whittier	Los Angeles	5,000
Sequoia and Pescadero	San Mateo	3,000
Anaheim	Orange	2,500
Campbell, Live Oak, Santa Clara	Santa Clara	2,500
College of San Mateo (Additional Campus)	San Mateo	2,500
Oxnard, Moorpark, Simi, Santa Paula, Fillmore	Ventura	2,500
Sweetwater—Coronado	San Diego	2,500
Grossmont—Mountain Empire	San Diego	2,250
Foothill College (Additional Campus)	Santa Clara	2,000
Antioch (Additional Campus)	Contra Costa	1,500
Berkeley, Albany, Emeryville	Alameda	1,500
Two-County Unit	Merced-Madera	1,500
Burbank	Los Angeles	1,250
County Unit	San Luis Obispo	1,000
East Kern and Inyo County Area	Kern	950
Moraga (Additional Campus)	Contra Costa	750
Victor Valley	San Bernardino	550
Barstow	San Bernardino	400
Total—22 Colleges	....	56,650

[1] Although these are arranged in descending order on projected 1975 full-time enrollment, this is not intended to indicate urgency or need in this same order.

3. *In accordance with Principle 5 of A Study of the Need for Additional Centers of Public Higher Education in California as approved by both the State Board of Education and The Regents of the University of California—"in order that a possible new institution may serve the greatest number of eligible students, it should be placed near the center of the population served by it"—the Stanislaus County State College authorized by the 1957 Legislature and with a 1975 estimated enrollment of 2,500 be located in the vicinity of Salida; and that the state college in the North Bay Counties, likewise authorized by the 1957 Legislature and with an estimated 1975 enrollment of 2,350, be located in the vicinity of Petaluma.*

4. *New state colleges be started as soon as possible and certainly not later than 1962 in these areas: the Los Angeles–Long Beach Metropolitan Area in the vicinity of the Los Angeles International Airport;*

the San Bernardino–Riverside–Ontario Metropolitan Area in the vicinity of Rialto.

5. *In 1965 and again in 1970, if applicable, and before considering the need for new state colleges in any other areas of the state, careful studies be made by the Liaison Committee or the then existing coordinating machinery of the following State Economic Areas to determine the actual need then existing for new state colleges:*

State Economic Area

F Los Angeles–Long Beach Metropolitan Area, vicinity of Griffith Park–Glendale
A San Francisco–Oakland Metropolitan Area, vicinity of Redwood City
A San Francisco–Oakland Metropolitan Area, Contra Costa County
K Bakersfield Metropolitan Area, Kern County
7 South Coastal Area, Ventura County

6. *The three new campuses of the University of California approved by The Regents in 1957—the San Diego–La Jolla area, the Southeast Los Angeles–Orange County area, and the South Central Coastal area—be completed without delay and in any event started not later than 1962. Furthermore, the Committee recommends that the "Eastwood" campus to serve the Southeast Los Angeles–Orange County area should be located in the western section of the Puente Hills in the Whittier area.*

7. *Inasmuch as the estimated University enrollment potential of the Berkeley campus of the University is 43,950 in 1975 (as compared with a maximum enrollment of 27,500 for the Berkeley campus as recommended above), the Liaison Committee or the then existing coordinating machinery undertake appropriate studies of how best to accommodate the difference between these figures (approximately 16,000), such steps to include careful study of these possibilities:*

a. *Diversion of some of these potential students to the Davis campus and the new South Central Coast campus.*

b. *The accommodation of the remaining part of the difference (i.e., 16,000 less the impact of* (a) *above) through the establishment of branch installations from existing campuses in specialized fields of study, such as instruction in science at Livermore. (These would be similar to the off-campus centers for teacher education now operated by certain of the state colleges.)*

8. *In 1965, and again where applicable in 1970, studies be made by the Liaison Committee or the then existing coordinating machinery on the need for additional University facilities in the San Joaquin Valley and the Los Angeles area. In the latter area special consideration should be given as to how the difference between the 1975 estimates of potential University enrollment of 52,550 and the 27,500 maximum of the*

UCLA campus (some 25,000 students) can best be accommodated. Such considerations should include the following:

a. *To what extent will this difference be cared for by the new Southeast Los Angeles–Orange County campus, and to what extent could these potential students be diverted to the La Jolla, Riverside, and Santa Barbara campuses?*

b. *Will there be a need for the establishment of branch installations in specialized fields of study from existing campuses in this area similar to that included in Recommendation 7 above? Further, that no campuses of the University of California be established prior to the development of campuses presently authorized by The Regents. (This does not apply to the establishment of branch installations in specialized fields of study from existing campuses.)*

9. *Because the University among the publicly supported institutions in California has the sole responsibility for the preparation for such professions as Architecture, Dentistry, Law, Librarianship (graduate), Medicine, Optometry, Pharmacy, Public Health, and Veterinary Medicine, periodic studies be made of the relation of supply to demand, particularly in fields where there seems likely to be shortages, such as Medicine and Pharmacy, for the purpose of determining what steps the University should take to meet its responsibilities in these professional fields.*

Section V

FACULTY DEMAND AND SUPPLY

In assessing the capacity of present or future institutions to offer educational programs, it is necessary to consider the availability of faculty. Buildings and equipment are essential, but without teachers they are useless. For this reason the Technical Committee on Institutional Capacities and Area Needs has developed an up-to-date study of faculty demand and supply.

Fortunately, the Joint Staff for the Liaison Committee did a similar study,[1] which was published in 1958. Recommendation Number 6, given on page 75 of this study, said in part:

> Inasmuch as more complete and adequate data may change the estimates of staff needs and better disclose the sources from which these needs will be met, the results of this study be re-examined in 1960, such re-examination to pay particular attention to the output of doctor's degree holders by California institutions in relation to the needs of the State. . . .

The subcommittee assigned to the present study of faculty demand and supply has used the earlier study as a base, has updated the essential tables taking into account more recent projections of enrollment, and has introduced other data which were not available in 1957 and 1958. Recognition of the pioneer work in this field by the Joint Staff and by Ray C. Maul, Assistant Director of Research of the National Education Association, is gratefully extended.

Delimitation of the Study on Faculty Demand and Supply

This is a *status quo* study. Its predictions are based on present conditions as to major policy affecting the various segments of public higher education and present trends of supply. Accordingly, it is limited to post-high school educational institutions including junior colleges, state colleges, the University of California, and independent colleges and universities.

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[1] Joint Staff for the Liaison Committee, *A Study of Faculty Demand and Supply in California Higher Education, 1957–70.* Berkeley, University of California Press, 1958.

Basic Questions

The basic questions that will be considered in this study are similar to those raised in the earlier study which are as follows:

1. How many new staff members are estimated to be needed by 1975, in selected subject fields and in total, by the junior colleges, state colleges, University of California, and independent colleges and universities in the state?
2. What are the characteristics of faculty at the time of first appointment with respect to the geographical source of recruitment, highest degree held, the occupation from which recruited, institution from which the doctorate was received, and rank to which first appointed?
3. What is the probable supply which can be expected to be available nationally and from California institutions?
4. In which subject matter fields are there over-supply, balance, or under-supply as of the present time?
5. What are the possibilities of meeting the demands of the period up to 1975 from the probable available supply?

Assumptions

The results of a study such as this are only as valid as the assumptions on which it is based. The necessity of projecting many variable factors for seventeen years requires the acceptance of many assumptions. More will be said about these assumptions later in this report. However, the more general ones are presented here.

It is assumed that:

1. Enrollment predictions will be accurate and dependable.
2. General educational policies will remain stable.
3. Physical facilities will be available as needed.
4. Ratios of staff to students will remain as at present.
5. Replacement for staff separations will be about as in the past (4.5 per cent for the junior colleges, 6 per cent for the state colleges, 4.2 per cent for the University of California and 6 per cent for independent colleges).
6. Graduate degrees will continue to be produced in conformity with presently reported institutional plans.
7. The same percentage of the graduate degree holders produced within the state will enter college teaching in California.

8. The proportion of faculty available from a deferred supply will remain constant.

9. Approximately the same per cent of master's and doctor's degree holders will be appointed to the faculty posts of the various segments of higher education as has been the case in the past.

Sources of Data

The basic data used in this study came from the following sources:

1. Faculty characteristics material for the years prior to 1957–58 from *Faculty Demand and Supply in California Higher Education, 1957–1970.*

2. Characteristics of newly-appointed faculty for the various segments of higher education in California (especially the junior colleges and independent colleges), and the percentage of California doctorates entering college teaching, from material collected for the National Education Association (NEA) Study, *Teacher Supply and Demand in Universities, Colleges and Junior Colleges, 1957–58 and 1958–59.* (NEA Research Report 1959-R-10.)

3. Characteristics of newly-appointed faculty for the state colleges and the University of California from the records of the Personnel Office of the State Department of Education and the Bio-Bibliographical records of the University of California, respectively.

4. Number and distribution of graduate degrees awarded in California by field and institution from *Earned Degrees Conferred by Higher Educational Institutions, 1956–57* and *Ibid., 1957–58* (U.S.O.E. Circulars 527 and 570).

5. Opinions on the relationship of supply and demand in various subject matter fields from an opinionnaire sent to the placement officers of American colleges and universities preparing graduates for college teaching.

6. Information regarding expansion of junior college credential programs from the directors of teacher education of California colleges and universities.

7. The number of graduate degree holders placed in college teaching within and without the state from the placement offices of California colleges and universities granting master and doctoral degrees.

8. Projections of doctoral degrees to be awarded by California institutions by field from 1959 to 1975 from a questionnaire sent to the heads of departments of the colleges and universities in California granting graduate degrees.

9. Enrollment estimates for all segments of higher education from projections developed by the State Department of Finance.

Estimates of Demand for New Faculty Members

Within the framework described above this section contains estimates of the numbers of new faculty members needed in California higher education to serve projected enrollments and to replace normal attrition of faculty members who die, retire, or resign. The most important element in demand for new faculty members is the projected enrollment of full- and part-time students in California institutions of higher education.

Estimates of Future Enrollments. Enrollment projections for each segment of higher education in California in terms of full-time, part-time, and total students were taken from figures developed by the State Department of Finance, dated November 13, 1959. These projections have been made for the years 1960, 1965, 1970, and 1975. Table 15 shows these basic enrollment projections for each segment of higher education. Part A of the table shows a projection of total enrollment, including both full-time and part-time students, which exceeds one million college students in 1975. This amounts to a tripling of California college enrollments in the seventeen-year period from 1959 to 1975. Part B of the table shows projections of full-time students (those enrolled for twelve or more semester units of credit). Full-time students comprised 67 per cent of total enrollment in 1958 and are estimated to account for 64 per cent of total enrollment in 1975.

A comparison of Parts A and B of Table 15 indicates that the public junior colleges and the state colleges both serve large numbers of part-time students as well as full-time students, while the University of California serves primarily full-time students. In addition, the enrollment projections indicate that the number of part-time students will increase at a somewhat higher rate than the number of full-time students. The projections of full-time students show the following per cents of increase by segment over 1958 enrollments: state colleges, 349; University of California, 216; junior colleges, 176; and independent colleges, 58.

General Procedure for Estimating Faculty Demand. In the previous study[2] of faculty supply and demand by the Joint Staff of the Liaison Committee, demand was estimated for each subject field by expanding the 1953 full-time equivalent departmental staff (obtained in the 1955 *Restudy of the Needs of California in Higher Education*), in the same proportion as future enrollment projections. In other words, total demand for faculty was built up by adding the estimated demands in each subject field. However, since a standard replacement factor was applied

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[2] *Ibid.*

to each subject field, and since the 1953 distribution of staff among the different subject fields in each segment of higher education was assumed to remain constant, this method produced results similar to those which would have been obtained by use of an over-all student-faculty ratio.

In the present study the general procedure is to use observed student-faculty ratios to estimate the total faculty needed for each segment of higher education and for each year to 1975. Since these ratios are applied to year-by-year enrollment projections (interpolated from the enrollment estimates shown in Table 15) the increment of new staff required to meet increased enrollments is calculated as the difference between the size of total staff for a given year and the size of total staff for the prior year. In addition to the numbers of faculty needed for increased enrollments, an increment must be added for replacement of staff who die, retire, or resign each year. These replacement factors in percentages are indicated for each segment of higher education in later tables.

Table 15

Actual and Projected Enrollments in Each Segment of Higher Education in California, 1958–1975

Year (Fall)	Junior Colleges	State Colleges	University of California	Independent Colleges	Total
A. Actual and Projected Total Enrollment					
1958	147,928	80,091	43,547	64,620	336,186
1960	188,600	108,800	50,900	71,350	419,650
1965	265,500	202,100	77,850	83,450	628,900
1970	337,300	301,100	107,300	94,100	839,800
1975	418,650	377,900	137,550	101,950	1,036,050
B. Actual and Projected Full-Time Enrollment (Includes Special Students)					
1958	91,162	44,528	43,101	46,824	225,615
1960	115,750	58,600	50,400	51,850	276,600
1965	162,600	104,950	77,000	60,550	405,100
1970	205,200	157,150	106,050	68,400	536,800
1975	251,400	200,000	136,000	73,950	661,350

Source: Carl M. Frisen, State Department of Finance, November 13, 1959. Total enrollment includes both full-time and part-time students. Full-time students are those enrolled for twelve or more semester units of credit.

Table 16 shows a comparison of different categories of faculty and enrollment with resulting student-faculty ratios, to provide a back-

Table 16

Comparison of Different Faculty and Enrollment Categories and Student-Faculty Ratios by Segment of Higher Education in California

Categories of Faculty, Enrollment, and Ratios	Segment of Higher Education			
	Junior Colleges[1] (1955-56)	State Colleges[2] (1958-59)	University of California[3] (1958-59)	Independent Colleges[4] (1955-56)
Faculty-Individuals				
1. Full-Time (Ranked)	3,589	3,282	3,540	3,114
2. Part-Time (Ranked)	....	903	....	....
3. Other	....	....	2,201	....
4. Total	5,676	4,185	5,741	5,718
Faculty-FTE				
5. Full-Time (Ranked)	....	3,282	2,912	....
6. Part-Time (Ranked)	....	287	....	....
7. Other	....	....	1,213	....
8. Total	4,143	3,569	4,125	3,507
Per Cent Line 1 of Line 8	86.6%	91.9%	85.8%	88.8%
Enrollment-Individuals[5]				
1. Full-Time (Graded)	70,165	44,528	43,101	40,003
2. Part-Time	29,245	35,563	442	12,692
3. Total	99,410	80,091	43,543	52,695
Enrollment-FTE				
4. Full-Time (Graded)	....	....	....	....
5. Part-Time	....	....	....	....
6. Total	....	56,345	....	....
Student-Faculty Ratios				
1. Full-Time Individuals (Faculty and Enrollment)	19.6	13.6	12.2	12.8
2. Total Individuals (Faculty and Enrollment)	17.5	19.1	7.6	9.2
3. Total FTE (Faculty and Enrollment)	....	15.8	....	....

[1] Data on total faculty individuals and total faculty FTE from *Faculty in Institutions of Higher Education* (Washington: U.S. Office of Education, Circular 504, November 1955). Data on full-time faculty individuals from "Salaries of Certificated Employees in California Public Schools, 1955-56" (Sacramento: Bureau of Education Research, State Department of Education).

[2] Data on faculty individuals and FTE from Tables 1 and 2, "Faculty and Instructional Summary," Part E of 1958-59 Statistical Report of the California State Colleges.

[3] Data on faculty individuals and FTE from Table XII, University of California *Statistical Addenda*, 1958-59. These data do not include administrative officers, non-teaching research staff, or extension staff.

[4] Data on total faculty individuals and total faculty FTE from USOE Circular 504, based on fall 1955. Full-time faculty individuals are estimated on the ratio of full-time individuals to total faculty in the state colleges and the University of California.

[5] Enrollment data for junior colleges and independent colleges from "Full-time and Part-time Students and Veterans in Institutions of Higher Learning, 1955-56," Bureau of Education Research, State Department of Education, March 1956.

ground for understanding the advantages and disadvantages of the definitions subsequently used. The most logical and comprehensive definition of the number of students to be served, and the number of faculty needed to serve such students, would be that of full-time equivalent enrollment and full-time equivalent faculty. The number of part-time students varies tremendously from institution to institution, and also from one segment of higher education to another, as does the number of part-time faculty members employed to carry the instructional load; however, as indicated in Table 16, full-time equivalent (FTE) data are not available for all segments of higher education.

For the junior colleges and for independent colleges Table 16 shows total faculty individuals (both full-time and part-time) as well as total full-time-equivalent faculty (FTE) from the United States Office of Education Circular 504 for 1955. A fairly complete current breakdown of faculty in terms of individuals and FTE is available for the state colleges and the University as shown in the upper portion of Table 16. Student enrollment in terms of full-time and part-time individuals is available for all segments as shown in this table, but only for the state colleges in terms of full-time-equivalent students (the sum of all student-credit hours divided by fifteen per semester). Finally, the bottom portion of Table 16 indicates the considerable variation in student-faculty ratios which results from different categories of faculty and/or enrollment. In the state colleges, for example, the ratio varies from 13.6 full-time students per full-time faculty member, to 19.1 full- or part-time students per full- or part-time faculty member. A more realistic measure than either of these would be the 15.8 FTE students per FTE faculty member. On the other hand, the most comparable definition of faculty for both demand and supply in all segments of higher education in California is probably that of full-time individuals with the rank of instructor and above. Most data on the characteristics of new faculty members are available in these terms.

In addition, supply of new faculty members will be largely estimated in these terms. However, it would be *incorrect* to ignore the large number of part-time students in various institutions and segments of higher education and, likewise, to ignore the appreciable number of part-time faculty members with the rank of instructor and above or with other classifications. The tabulation on the following page shows a comparison of the FTE and full-time faculty estimates for each of the four segments of higher education for 1960, 1965, 1970, and 1975.

In Tables 17, 18, 19 and 20, which follow, estimates of total full-time individuals with the ranks of instructor needed per year are shown. These are summarized in Table 21, which, for purposes of comparability among the segments of higher education and with the later supply estimates, contains estimates of *new* faculty needed only in terms of new full-time individuals.

Segment	1960		1965		1970		1975	
	FTE	Full-Time	FTE	Full-Time	FTE	Full-Time	FTE	Full-Time
Junior Colleges...	6,849	5,876	9,621	8,254	12,142	10,416	14,876	12,761
State Colleges.....	4,746	4,309	8,651	7,717	12,930	11,555	16,352	14,706
University of California.......	4,802	4,131	7,344	6,311	10,123	8,693	12,976	11,148
Independent Colleges.........	4,548	4,051	5,311	4,730	6,000	5,344	6,487	5,777
Total.........	20,945	18,367	30,927	27,012	41,195	36,008	50,691	44,392

Demand for New Faculty in Public Junior Colleges. Table 17 contains estimates of demand for total full-time faculty in the junior colleges by year in column 2. Estimates of the numbers of new faculty needed each year are shown in columns 4, 5, and 6, in terms of new full-time individuals. Column 4 indicates the increment of new full-time faculty needed because of increased enrollment; this increment is computed as the difference between total full-time faculty in column 4 from each year to the subsequent year. Column 5 indicates the increment of new faculty needed each year to replace losses among the total faculty of each prior year. Total new full-time faculty is shown in column 6 as the sums of columns 4 and 5.

Table 17 of the current study may be compared with Table 4, page 16,[3] of the previous study. However, estimates of new staff needed in the previous study were in terms of FTE staff rather than full-time individuals. In addition, the previous study used a replacement factor of 8 per cent whereas the current study uses a factor of 4.5 per cent for junior college staff.

Demand for New Faculty in State Colleges. Table 18 shows estimated demand for full-time faculty members in the state colleges each year to 1975. The larger number of full-time-equivalent faculty (16,352 in 1975 as compared with 14,706 for full-time faculty) reflects the number of part-time faculty members employed to help carry the total instructional load of the state colleges. Both of these 1975 estimates—FTE and full-time—include such positions as division chairmen, coordinators, and supervisors who are appointed on a class and rank basis but do not necessarily spend full time in classroom teaching.

The replacement factor used in this table is 6 per cent of the prior year's full-time faculty, based on the separation rate of full-time state college faculty from 1954–55 through 1958–59. (The previous study

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[3] *Ibid.*

Table 17
Estimated New Full-Time Faculty Needed by Year to 1975 in Public Junior Colleges

Fall	Full-Time Enrollment	Full-Time[1] Faculty	Student-Faculty Ratio	New Full-Time Faculty Needed		
				Enrollment Increment	Replacement[2] @ 4.5%	Total
	1	2	3	4	5	6
Actual						
1955.............	70,165	3,589	19.6	.....	.....	.....
1956.............	74,082	3,969	18.7	.....	.....	.....
1957.............	80,916	4,136	19.6	.....	.....	.....
1958.............	91,162	4,637	19.7	.....	.....	.....
Projected						
1959.............	103,588	5,258	19.7	621	209	830
1960.............	115,750	5,876	19.7	618	237	855
Total 1959–60..	....	......	....	1,239	446	1,685
1961.............	125,120	6,351	19.7	475	264	739
1962.............	134,490	6,827	19.7	476	286	762
1963.............	143,860	7,302	19.7	475	307	782
1964.............	153,230	7,778	19.7	476	328	804
1965.............	162,600	8,254	19.7	476	350	826
Total 1961–65..	....	......	....	2,378	1,535	3,913
1966.............	171,120	8,686	19.7	432	371	803
1967.............	179,640	9,119	19.7	433	391	824
1968.............	188,160	9,551	19.7	432	410	842
1969.............	196,680	9,984	19.7	433	430	863
1970.............	205,200	10,416	19.7	432	449	881
Total 1966–70..	....	......	....	2,162	2,051	4,213
1971.............	214,440	10,885	19.7	469	469	938
1972.............	223,680	11,354	19.7	469	490	959
1973.............	232,920	11,823	19.7	469	511	980
1974.............	242,160	12,292	19.7	469	532	1,001
1975.............	251,400	12,761	19.7	469	553	1,022
Total 1971–75..	....	......	....	2,345	2,555	4,900
Total 1959–75	....	......	....	8,124	6,587	14,711

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[1] From "Salaries of Certificated Employees in California Public Schools," (Sacramento: Bureau of Education Research, State Department of Education).

[2] Based on Table 11, p. 19, "California's Need for Teachers," 1958–59 study of teacher supply and demand in California public schools (Sacramento: State Department of Education, Bulletin, January 1960). This compares with an 8 per cent replacement factor used in the previous faculty study.

Table 18

Estimated New Full-Time Faculty Needed by Year to 1975
in California State Colleges

Fall	Full-Time Enrollment	Full-Time Faculty	Student-Faculty Ratio	New Full-Time Faculty Needed		
				Enrollment Increment	Replacement @ 6%	Total
	1	2	3	4	5	6
Actual						
1955	33,910	2,037	16.6	.....	.....	.....
1956	38,338	2,501	15.3	.....	.....	.....
1957	41,582	2,991	13.9	.....	.....	.....
1958	44,528	3,282	13.6	.....	.....	.....
Projected						
1959	51,639	3,797	13.6	515	197	712
1960	58,600	4,309	13.6	512	228	740
Total 1959–60	....	......	....	1,027	425	1,452
1961	67,870	4,990	13.6	681	258	939
1962	77,140	5,672	13.6	682	299	981
1963	86,410	6,354	13.6	682	340	1,022
1964	95,680	7,035	13.6	681	381	1,062
1965	104,950	7,717	13.6	682	422	1,104
Total 1961–65	....	......	....	3,408	1,700	5,108
1966	115,390	8,484	13.6	767	463	1,230
1967	125,830	9,252	13.6	768	509	1,277
1968	136,270	10,020	13.6	768	555	1,323
1969	146,710	10,788	13.6	768	601	1,369
1970	157,150	11,555	13.6	767	647	1,414
Total 1966–70	....	......	....	3,838	2,775	6,613
1971	165,720	12,185	13.6	630	693	1,323
1972	174,290	12,815	13.6	630	731	1,361
1973	182,860	13,446	13.6	631	769	1,400
1974	191,430	14,076	13.6	630	807	1,437
1975	200,000	14,706	13.6	630	844	1,474
Total 1971–75	....	......	....	3,151	3,844	6,995
Total 1959–75	....	......	....	11.424	8,744	20,168

Table 19
Estimated New Full-Time Faculty Needed by Year to 1975 in the University of California

Fall	Graded Enrollment	Ranked[1] Faculty Individuals	Student-Faculty Ratio	New Ranked Faculty Needed		
				Enrollment Increment	Replacement[2] @ 4.2%	Total
	1	2	3	4	5	6
Actual						
1955	37,717	......	....	.....	.....	.....
1956	39,953	......	....	.....	.....	.....
1957	41,625	3,253	12.8	.....	.....	.....
1958	43,101	3,540	12.2	.....	.....	.....
Projected						
1959	45,850	3,758	12.2	218	149	367
1960	50,400	4,131	12.2	373	158	531
Total 1959–60	....	......	....	591	307	898
1961	55.720	4,567	12.2	436	174	610
1962	61,040	5,003	12.2	436	192	628
1963	66,360	5,439	12.2	436	210	646
1964	71,680	5,875	12.2	436	228	664
1965	77,000	6,311	12.2	436	247	683
Total 1961–65	....	......	....	2,180	1,051	3.231
1966	82,800	6.787	12.2	476	265	741
1967	88,600	7,262	12.2	475	285	760
1968	94,400	7,738	12.2	476	305	781
1969	100,200	8,213	12.2	475	325	800
1970	106,050	8.693	12.2	480	345	825
Total 1966–70	....	......	....	2,382	1,525	3,907
1971	112,180	9.195	12.2	507	365	872
1972	118,360	9,702	12.2	507	386	893
1973	124,540	10,208	12.2	506	407	913
1974	130,720	10,715	12.2	507	429	936
1975	136,000	11,148	12.2	433	450	883
Total 1971–75	....	......	....	2,460	2,037	4,497
Total 1959–75	....	......	....	7.613	4,920	12.533

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[1] Includes only individuals with the rank of instructor and up.

[2] Turnover among ranked personnel with regular appointments has been in 1956–57 to 1958–59, respectively, 5.9, 5.4, and 4.2 per cent.

Table 20

Estimated New Full-Time Faculty Needed by Year to 1975 in California Independent Colleges

Fall	Full-Time[1] Enrollment	Full-Time[2] Ranked Faculty	Student-Faculty Ratio	New Full-Time Faculty Needed		
				Enrollment Increment	Replacement @ 6%	Total
	1	2	3	4	5	6
Actual						
1955	40,003	3,114	12.8	.....	.....	.....
1956	42,396	......	....	.....	.....	.....
1957	44,378	......	....	.....	.....	.....
1958	46,824	3,658[3]	....	.....	.....	.....
Projected						
1959	49,300	3,852	12.8	194	219	413
1960	51,850	4,051	12.8	199	231	430
Total 1959–60	....	......	....	393	450	843
1961	53,590	4,187	12.8	136	243	379
1962	55,330	4,323	12.8	136	251	387
1963	57,070	4,458	12.8	135	259	394
1964	58,810	4,594	12.8	136	267	403
1965	60,550	4,730	12.8	136	276	412
Total 1961–65	......	......	....	679	1,296	1,975
1966	62,120	4,853	12.8	123	284	407
1967	63,690	4,976	12.8	123	291	414
1968	65,260	5,098	12.8	122	298	420
1969	66,830	5,221	12.8	123	306	429
1970	68,400	5,344	12.8	123	313	436
Total 1966–70	....	......	....	614	1,492	2,106
1971	69,510	5,430	12.8	86	321	407
1972	70,620	5,517	12.8	87	326	413
1973	71,730	5,604	12.8	87	331	418
1974	72,840	5,691	12.8	87	336	423
1975	73,950	5,777	12.8	86	341	427
Total 1971–75	....	......	....	433	1,655	2,088
Total 1959–75	....	......	....	2,119	4,893	7,012

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[1] For 1955 and 1956 from State Department of Education; other years from State Department of Finance.

[2] For 1955 estimated at 88.8 per cent of FTE faculty based on similar figures of 91.9 per cent for state colleges and 85.8 per cent for the University of California.

[3] Estimated.

used a replacement rate of 8 per cent.) Enrollment projections shown in Table 18 assume the establishment of new state colleges in Alameda County, Orange County, Stanislaus County, and the North San Francisco Bay Area during the period under study.

Demand for New Faculty in the University of California. Table 19 shows estimates of new faculty needed in the University of California to 1975. Enrollment projections include the assumption of new University campuses at La Jolla, Southeast Los Angeles, and the South Central Coast Section (Santa Clara Valley). Enrollment projections shown in this table are also defined as fall-graded enrollment, which is essentially the same as full-time enrollment (twelve or more units) at the University of California. New faculty needed is computed in terms of individuals with the rank of instructor and above and includes both full- and part-time faculty members. The replacement rate used in column 5 is 4.2 per cent compared with 6 per cent in the previous faculty study.

Demand for New Faculty in Independent Colleges and Universities. Table 20 indicates the number of full-time faculty individuals, with the rank of instructor and above, estimated to be needed in California independent colleges and universities to 1975. The source of data on faculty is the United States Office of Education Circular 504, November 1955, which gives both full-time-equivalent staff and total individual staff (with the rank of instructor and above) for resident instruction in courses of college grade. The replacement rate used in this table is 6 per cent as suggested in the NEA Higher Education Series Research Report entitled *Teacher Supply and Demand in Universities, Colleges, and Junior Colleges, 1957–58 and 1958–59* (pages 50 and 53).

Summary. Table 21 summarizes in Part A the *total* full-time faculty required in 1960, 1965, 1970, and 1975, for each segment of higher education, along with the corresponding estimates of full-time enrollment. Part B of this table indicates the number of *new* full-time faculty members needed to meet the needs of enrollment growth and replacement of existing staff, in order to achieve the estimates of total staff shown in Part A. Part B of this table also shows the average demand per year by segment, during successive five-year periods. For example, for the state colleges, Part A of the table indicates that in 1970 a total full-time faculty of 11,555 individuals with the rank of instructor and above will be necessary to carry the instructional load represented by the enrollment of 157,150 full-time students. In Part B of this table for the state colleges a need for 6,613 new full-time faculty members with the rank of instructor and above is indicated for the five-year period 1966–70, with an average requirement per year of 1,323 new faculty members.

Table 21

Summary of Total Full-Time Faculty Needed for Projected Enrollments and New Faculty Needed for Replacement and Enrollment Growth, All Segments, 1959–1975

A. Total Full-Time Faculty Needed for Selected Years

Fall	Category	Segment of Higher Education				Totals
		Junior Colleges	State Colleges	University of California	Independent Colleges	
1958..	Full-Time Faculty	4,637	3,282	3,540	3,658	15,117
	Full-Time Enrollment	91,162	44,528	43,101	46,824	225,615
1960..	Full-Time Faculty	5,876	4,309	4,131	4,051	18,367
	Full-Time Enrollment	115,750	58,600	50,400	51,850	276,600
1965..	Full-Time Faculty	8,254	7,717	6,311	4,730	27,012
	Full-Time Enrollment	162,600	104,950	77,000	60,550	405,100
1970..	Full-Time Faculty	10,416	11,555	8,693	5,344	36,008
	Full-Time Enrollment	205,200	157,150	106,050	68,400	536,800
1975..	Full-Time Faculty	12,761	14,706	11,148	5,777	44,392
	Full-Time Enrollment	251,400	200,000	136,000	73,950	661,350

B. New Full-Time Faculty Needed to Achieve Part A.

Period	Category	Segment of Higher Education				Totals
		Junior Colleges	State Colleges	University of California	Independent Colleges	
1959–60.	New Faculty Needed	1,685	1,452	898	843	4,878
	Average Per Year	842	726	449	422	2,439
1961–65.	New Faculty Needed	3,913	5,108	3,231	1,975	14,227
	Average Per Year	783	1,022	646	395	2,845
1966–70.	New Faculty Needed	4,213	6,613	3,907	2,106	16,839
	Average Per Year	843	1,323	781	421	3,368
1971–75.	New Faculty Needed	4,900	6,995	4,497	2,088	18,480
	Average Per Year	980	1,399	899	418	3,696
1959–75.	Total New Faculty	14,711	20,168	12,533	7,012	54,424
	Average Per Year	865	1,186	737	412	3,201

C. Student-Faculty Ratios and Replacement Percentages Used

Category	Junior Colleges	State Colleges	University of California	Independent Colleges
Student-Faculty Ratios.....	19.7	13.6	12.2	12.8
Replacement Per Cents......	4.5%	6.0%	4.2%	6.0%

For the entire seventeen-year period from 1959 through 1975 for the state colleges, a total of 20,168 new full-time faculty members should be recruited as estimated in this table, or an average of 1,186 per year for the entire period. Part C of the table summarizes pertinent student-faculty ratios and replacement percentages used in computing the faculty demand shown in Parts A and B of the table.

Observations on the Foregoing Data

A few observations might be made at this point in comparing this current study of faculty supply and demand in California higher education with the earlier study. In general, the numbers of new faculty estimated for the comparable periods 1961–65 and 1966–70 are very similar in the two studies. The number of total faculty needed at the selected years, 1965 and 1970, is somewhat larger in the current study than in the previous one, but it should be remembered that additional campuses at the University of California and additional state colleges are included in the present study. Appreciably larger numbers of state college faculty are estimated in this study than in the earlier one, while the numbers of junior college faculty in the current one are somewhat less. The magnitude of the task facing higher education in California may be summarized in the following projections from Table 21.

In 1975, it is estimated that a total full-time faculty of 44,392 individuals will be required to meet the instructional load of a projected enrollment of 661,350 full-time students. Between 1959 and 1975, it will be necessary to prepare and recruit a total of 54,424 new full-time faculty members to meet the needs of California's colleges and universities, in terms of enrollment growth and replacement of faculty members lost through attrition. Regardless of changes that might be made in the student-faculty ratios, the replacement percentages, the enrollment projections, or the distribution of staff among various subject fields in a more refined study, it is not likely that the magnitude of the numbers summarized above would be appreciably changed.

It should be pointed out, however, that the enrollment projections used to estimate the probable demand for staff do not take into account the establishment of any colleges or universities other than those currently in operation or already authorized. Since the opening of a new college taps a new potential supply of students, the approval of any new state-supported colleges, the activating of new junior colleges by local action, or the establishment of new independent colleges will increase the demand for faculty.

It is apparent, therefore, that administrators, board members, legislators, and all others concerned with the future of California's institutions of higher education and the students whom they serve, face a formidable problem in obtaining qualified faculty members to meet the dimensions of the demand situation presented in this report.

Table 22

Source of Newly Appointed Full-Time Faculty of the Junior Colleges, State Colleges, and the University of California by Location of Institution Where Highest Degree[1] Was Granted, 1957–58 and 1958–59

Segment	Highest Degree Awarded by Institutions				Total	
	In California		Out-of-State (Including Foreign)			
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Junior Colleges[2]........	199	47.5	220	52.5	419	100.0
State Colleges[3].........	546	47.4	606	52.6	1,152	100.0
University of California[4]...............	94	23.8	301	76.2	395	100.0
Total..............	839	42.7	1,127	57.3	1,966	100.0

[1] For junior colleges this is the total of master and doctoral degrees, rather than the highest degree.

[2] New teacher is one who has not previously taught at the junior college level.

[3] Institution where degree was received was gathered only for the appointees with the doctorate. This proportion was modified by applying the ratio between the doctor's degree holders with out-of-state residence and the total appointees in this category.

[4] Actual count.

SOURCE: Bio-Bibliographical Service, University of California; Personnel Office Records, State Department of Education; and National Education Association Teacher Demand and Supply Study, 1957–58 and 1958–59.

Certain Characteristics of Faculty Appointees

In determining the relation of faculty demand and supply for California institutions, it is necessary to have some information regarding the characteristics of the new staff members appointed to fill the vacancies existing in the various segments of higher education. This information falls into two categories: the sources of supply from which these appointees have come and the type of preparation required in the past. Wherever possible, information has been collected regarding appointees for the years 1954–58. The characteristics that directly affect the computation of net demand and actual supply will be presented and discussed briefly in the following paragraphs.

Geographical Origin of Appointees. The previous study of faculty demand and supply used the place of residence at time of appointment in determining the proportions of new staff obtained in-state and out-of-state respectively.[4]

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[4] *Ibid.* Tables 11 and 16, pp. 28 and 32 respectively.

Table 23

Institutions That Conferred Five or More of the Doctorates Held at the Time of Appointment by New Full-Time Staff Members of California State Colleges and the University of California, 1954 Through 1958

Institutions Awarding the Doctorate	Doctorates from These Institutions Appointed by:					
	University of California			State Colleges		
	Number	Per Cent of Total	Rank	Number	Per Cent of Total	Rank
California	111	18.9	1	145	15.5	1
California Institute of Technology	9	1.5	16	...	[1]	..
Chicago	28	4.8	3	24	2.6	12
Claremont	...	[1]	..	5	.5	29
Colorado	...	[1]	..	16	1.7	17
Columbia	24	4.0	6	40	4.3	4
Cornell	11	1.9	15	11	1.2	22
Denver	...	[1]	..	14	1.5	18
Florida	...	[1]	..	5	.5	29
Harvard	69	11.8	2	8	.9	24
Illinois	20	3.4	9	25	2.7	11
Indiana	6	1.0	19	29	3.1	8
Iowa	7	1.2	18	37	4.0	6
Iowa State	13	2.2	11	18	1.9	15
Kansas	...	[1]	..	13	1.4	19
Massachusetts Institute of Technology	13	2.2	11	...	[1]	..
Michigan	26	4.4	5	22	2.4	13
Michigan State	...	[1]	..	5	.5	29
Minnesota	13	2.2	11	34	3.6	7
Missouri	...	[1]	..	12	1.3	21
Nebraska	...	[1]	..	10	1.1	23
New York	...	[1]	..	13	1.4	19
Northwestern	6	1.0	19	17	1.8	16
Ohio State	...	[1]	..	29	3.1	8
Oklahoma	...	[1]	..	6	.6	26
Oregon	...	[1]	..	21	2.2	14
Oregon State	...	[1]	..	6	.6	26
Pennsylvania	6	1.0	19	...	[1]	..
Princeton	19	3.2	10	...	[1]	..
Southern California	8	1.4	17	63	6.7	3
Stanford	23	3.9	7	77	8.2	2
Texas	5	.9	22	7	.7	25
Washington	12	2.0	14	38	4.0	5
Wisconsin	23	3.9	7	29	3.1	8
Yale	28	4.8	3	6	.6	26
Sub-Total	480	81.8	..	785	84.0	..
Other Institutions	107	18.2	..	150	16.0	..
Total Doctorates	587	100.0[2]	..	935	100.0[2]	..

[1] Less than .5.

[2] Because of independent rounding, the sum of the parts may differ from the total.

SOURCE: Bio-Bibliographical Service, University of California, and Personnel Office Records, State Department of Education.

In preparing this study, however, it became apparent that the most pertinent data was the geographical location of the institutions from which the highest degrees of the appointees were obtained, since, regardless of their place of residence, it was in that state that they received their training. This information was available for the state colleges and the University for 1957–58 and 1958–59 only, and it appears in Table 22. From that table it can be seen that the per cents of the new full-time appointees during this period who received their highest degrees outside of California were: junior colleges, 52.5 per cent; state colleges, 52.6 per cent; and the University of California, 76.2 per cent.

Institutional Sources of Appointees. Table 23 gives those institutions from which five or more full-time new appointeees to the state colleges and the University of California from 1954 through 1958 received doctorates. The University of California is the largest single source of faculty for its own campuses and for the state colleges. It supplied 18.9 per cent of its own new staff and 15.5 per cent of the new state college faculty during this five-year period.

There is considerable divergence among other principal sources of staff for the two segments. For example, the second to fifth place sources for the University are Harvard (11.8 per cent), Chicago (4.8 per cent), Yale (4.8 per cent), and Michigan (4.4 per cent). For the state colleges, the second to fifth places are held by Stanford (8.2 per cent), University of Southern California (6.7 per cent), Columbia (4.3 per cent), and University of Washington (4.0 per cent).

As will be noted from Table 23 there are four institutions that supplied five or more new staff to the University of California that are not on the state college list and thirteen that supplied five or more new faculty to the state colleges that are not on the University of California list. Thus, although there are eighteen institutions that might be called common sources of supply for both segments, there are seventeen that are not.

Occupational Sources of Appointees. Table 24 shows the occupation of the new staff of the state colleges and the University of California at the time of appointment from 1954 through 1958. As might be expected, the large majority (over 80 per cent) of the appointees came from teaching, research, and directly from graduate school. The same holds true for the junior colleges, as can be seen from Table 25. The relative contribution of these three sources in each of the three segments varies considerably, however, with teaching accounting for 70.9 per cent of the junior college, 63.2 per cent of the state college, and only 37.7 per cent of the University totals. In all three segments, a considerable proportion of the new faculty came from sources which constitute a "deferred supply"—that is, non-college teaching fields. In the junior colleges this proportion is very large owing to the dependence on high school and elementary teachers as a source of supply.

Table 24
Occupational Source of Full-Time Staff of California State Colleges and the University of California at Time of Appointment
1954 Through 1958

Prior Occupational Source	State Colleges		University of California		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Teaching	1,506	63.2	312	37.7	1,818	56.6
Graduate School	295	12.4	279	33.7	574	17.9
Research	114	4.8	102	12.3	216	6.7
Government	125	5.2	75	9.1	200	6.2
Industry	222	9.3	38	4.6	260	8.1
Miscellaneous	121	5.1	22	2.6	143	4.5
Total	2,383	100.0	828	100.0	3,211	100.0

Source: Bio-Bibliographical Service, University of California, and Personnel Office Records, State Department of Education.

Type of Preparation. In addition to the foregoing, the degrees held at time of appointment supply information on the approximate demand for graduates with doctoral, master's, and other degrees.

Table 26 shows the type of preparation of the total new full-time staff appointed to the state colleges and the University of California from 1954 through 1958. Although individual years are not shown, there has not been a significant downward trend in the percentage possessing the doctorate in either segment. The state colleges have shown a greater variation with a high of 45.9 per cent in 1955 and a low of 37.3 per cent in 1958, but there has not been an even trend. The University of California percentage has varied only 3 per cent over this same period, with the high in 1955 and the low in 1956.

Completely comparable data for the junior colleges were not available. However, Table 27 gives the number and per cent by level of preparation of that segment's new staff appointed in 1957–58 and 1958–59. As would be expected, a much lower percentage of the junior college faculty held the doctorate at time of appointment than for any other segment. This percentage, however, is considerably above the comparable national figure of 7.4 per cent for junior colleges.[5]

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[5] *Teacher Supply and Demand in Universities, Colleges, and Junior Colleges, 1957–58 and 1958–59.* Washington, D.C., National Education Association, Research Report 1959 R10, June 1959.

The independent colleges and universities have not been dealt with in any detail here because of the lack of comparable data. There has, however, been an opportunity to check some of the characteristics of the new faculty of this segment and to compare them with the appointees to the faculties of the other three segments. This was possible because of the availability of data collected for the NEA Teacher Supply and Demand Study mentioned above. From this comparison it has been concluded that, in general, the characteristics of the new faculty of these independent colleges and universities approximate those of the appointees to the staffs of the state colleges and the University of California.

Table 25

Previous Occupations and Level of Prior Teaching of Appointees to the Public Junior College Faculties in California, 1957–58 and 1958–59[1]

Previous Occupation and Level of Prior Teaching	1957-58		1958-59		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
College Teaching....	77	13.1	126	16.7	203	15.1
Junior College Teaching..........	89	15.1	121	16.1	210	15.6
High School Teaching..........	271	46.0	228	30.2	499	37.2
Elementary Teaching..........	20	3.4	21	2.8	41	3.0
Teaching Totals.	457	77.6	496	65.8	953	70.9
Graduate School.....	52	8.8	101	13.4	153	11.4
Research............	7	1.2	13	1.8	20	1.5
Industry.............	32	5.5	63	8.3	95	7.1
Government.........	15	2.5	29	3.8	44	3.3
Miscellaneous........	26	4.4	52	6.9	78	5.8
Nonteaching Totals[2]........	132	22.4	258	34.2	390	29.1
Total........	589	100.0	754	100.0	1,343	100.0

[1] The figures for 1958–59 include both technical and academic appointments; those for 1957–58 include only academic.

[2] The nonteaching totals are taken from the Edinger Report (see "Source"). The distribution of this number among graduate school, research, industry, government, and miscellaneous is obtained by extrapolation from the distribution in data collected for the NEA study (see "Source").

SOURCE: Oscar H. Edinger, Jr., *Summary of Source and Educational Background of New Junior College Teachers, 1957–58*, Pomona: Mt. San Antonio Junior College, Mimeo.; *ibid.*, 1958–59; and *Teacher Supply and Demand in Universities, Colleges, and Junior Colleges, 1957–58 and 1958–59*, Washington, D.C., National Education Association, Research Report 1959 R10, June, 1959.

Table 26

Highest Degrees Held by Full-Time Staff of California State Colleges and the University of California at Time of Appointment, 1954 Through 1958[1]

Degree	State Colleges		University of California		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Doctoral	958	40.2	580	70.0	1,538	47.9
Master	1,105	46.3	133	16.1	1,238	38.5
Bachelor	303	12.8	33	4.0	336	10.5
None	17	0.7	3	0.4	20	0.6
M.D. and D.D.S.	.....	.....	79	9.5	79	2.6
Total	2,383	100.0	828	100.0	3,211	100.0

[1] Highest degrees held by total full-time faculty of the state colleges in 1956 were: Doctoral, 53.5 per cent; Master, 38.2 per cent; Bachelor, 7.4 per cent; None, 0.9 per cent. The totals for the University of California for the same year were: Doctoral, 83.3 per cent; Master, 13.4 per cent; Bachelor, 2.6 per cent; None, 0.7 per cent.

Table 27

Highest Degree Held by New Appointees[1] to the Public Junior College Faculties in California, 1957–58 and 1958–59

Degree	Highest Degree Held at Time of Appointment in:				Total	
	1957–58		1958–59			
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Doctoral	39	7.6	49	10.4	78	9.2
Master	245	64.5	304	64.9	549	64.7
Less Than M.A.	106	27.9	116	24.7	222	26.1
Total	380	100.0	469	100.0	849	100.0

[1] New appointee as used here is one appointed who was not in junior college teaching the year before.

SOURCE: *Teacher Supply and Demand in Universities, Colleges, and Junior Colleges, 1957–58 and 1958–59.* Washington, D.C., National Education Association, Research Report 1959 R10, June, 1959.

Estimates of Net Demand for Net Supply of Faculty Available for California Higher Education Institutions

In order to translate the total demand for new faculty presented in Table 21 into a figure that can be related to the potential supply produced within California, it is necessary to compute the "net" demand for California-trained graduates by the type of degree needed. This is accomplished by utilizing the data on faculty characteristics.

Net Demand for California-Trained College Teachers. The method used in arriving at this figure is to deduct from the total need for each segment as shown in Table 21 the proportion of the demand that in the past has been met by persons trained outside California. This in-state demand is then reduced by the proportion that experience indicates can be expected to be recruited from a "deferred" supply (that is, those trained in California who do not go into college teaching immediately on receipt of their degree but who later come into the supply pool). After the net demand for each segment is thus determined, the proportions of those hired in the past at varying degree levels are then obtained in order to determine the demand for these various types of preparation.

Involved in this procedure are three critical assumptions:

1. That in the future the same proportion of California's needs will continue to be met from a supply trained outside the state.

2. That this state will continue to be able to recruit the same proportion of its new staff from business, industry, research, government, and miscellaneous fields

3. That the new staff appointees in the various segments will continue to have the same level of preparation as in the past.

The analysis that follows is valid only to the extent that these assumptions prove correct.

Table 28 presents a projection of this net demand for 1959–1975 based on the data on faculty characteristics presented in Tables 24 through 27. Since comparable data for the independent colleges were not available, the method used in the previous study of accepting faculty characteristic percentages half-way between those for the state colleges and the University of California has been followed for that segment.

To take an example, it can be seen from Table 28 that the total demand for 20,168 new faculty members for the state colleges during the next seventeen years is reduced to a total net demand of 2,882 persons who receive the doctorate from California institutions and go directly into teaching in this state. This net figure is obtained by assuming that 10,689 of the total need will be trained outside the state, that 2,275 will be recruited from a "deferred" supply, and that only 40 per cent of the 7,204 net supply to be obtained from California institutions must possess the doctorate.

On the same basis of computation, the total demand of 54,424 new staff members for all segments of higher education is reduced to a net demand of 5,702 to be obtained from the pool of doctor's degree holders produced in this state.

Table 28

Estimated Net Direct Demand for Doctor's, Master's, and Other Degree Recipients from California Institutions Needed to Staff California Higher Education, 1959–1975[1]

1	2	2		4		5		6		7		8		9	
Segment	Total Demand	Out-of-State		In-State		Deferred Supply[2]		Net Direct Supply Needed from California Schools[3]							
								Total[4]		Doctor's		Master's		Other	
		Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Junior Colleges	14,711	7,650	52[5]	7,061	48[5]	3,672	52[7]	3,389	48	305	9[9]	2,203	65[9]	881	26[9]
State Colleges	20,168	10,689	53[5]	9,479	47[5]	2,275	24[8]	7,204	76	2,882	40[8]	3,386	47[8]	936	13[8]
University of California	12,533	9,525	76[5]	3,008	24[5]	842	28[8]	2,166	72	1,516	70[8]	347	16[8]	303	14[10]
Independent Colleges	7,012	4,558	65[6]	2,454	35[6]	638	26[6]	1,816	74	999	55[6]	581	32[6]	236	13[6]
Total	54,424	32,422	60	22,002	40	7,427	34	14,575	66	5,702	39	6,517	45	2,356	16
Average Per Year	3,201	1,907	..	1,294	..	437	..	857	..	335	..	383	..	139	..

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[1] Assuming continuing percentage of appointees at several levels of preparation and percentage of needs obtained from non-California institutions.

[2] Those excluded from supply projections in Table 29.

[3] Those going directly into college teaching in California.

[4] In-state supply needs (column 4) less deferred supply (column 5).

[5] Based on percentage of new appointees for each segment who received highest degree (for junior college total degrees) within and without the state.

[6] Halfway between University of California and state college experience.

[7] Includes those coming from high school and elementary teaching (Edinger Study: 49.4 per cent, 1957–58; 33.2 per cent, 1958–59). Since the former does not include technical positions and the latter does, a percentage closer to the latter figure has been used in this computation (35 per cent) and those coming from industry, business, and miscellaneous nonteaching fields (exclusive of graduate school, which is computed in supply in Table 29). By extrapolation from NEA data and the Edinger Reports, this is determined to be 17 per cent. The two noncollege teaching groups and those coming from nonteaching make up 52 per cent of the total supply.

[8] Based on data from Bio-Bibliographical Service, University of California, and Personnel Office Records, State Department of Education, 1954 through 1958.

[9] Based on data taken from NEA study of Teacher Demand and Supply in Colleges, Universities, and Junior Colleges, 1957–58 and 1958–59.

[10] Includes M.D. and D.D.S. degrees.

For the remainder of this report, the emphasis will be on the demand for and supply of doctor's degree holders, although some special attention will be devoted in the following paragraphs to a discussion of the probable output of persons receiving credentials acceptable for junior college teaching.

Estimated Net Supply of California-Trained Doctorates. The net supply of California-trained doctorates that can be expected to meet the needs presented in Table 28 is based upon a projection of the total production of doctorates by all California institutions, reduced by the number of these graduates who will either not go into college teaching or who will do so outside of California.

An estimate of the number of doctorates to be available between now and 1975 could be obtained in at least two ways. The procedure followed in the Joint Staff study previously mentioned was to use an observed ratio between total enrollment and doctoral degrees granted so as to predict the future production. In this study actual projections of all the California institutions granting the Ph.D. or equivalent degrees were obtained. In all cases these projections were checked with the estimated graduate enrollments supplied this Technical Committee, and corrections were made wherever the institutional estimates seemed too far out of line with past experience.

The total number expected to be produced between 1958 and 1974 (the years from which the 1959–1975 supply must be obtained) is shown in Column 1 of Table 29. If these projections are accurate, there will be a gross supply of 34,679 doctorates produced during that period by California institutions.

Although the difference between current and projected production is large, a check of the relationships between California's percentage of the total national college enrollment in 1970 and its percentage of the total number of projected doctorates produced in that year tends to validate the institutional projections presented in Table 29. In 1970 California's proportion of the total national college enrollment will be 13.4 per cent.[6] In that year, the institutional projections of doctorates produced in California (2,472 as calculated from information supplied by institutional heads) are only 13.6 per cent of the national production of 18,100,[7] or approximately the same proportion as its portion of the total enrollment.

After obtaining the gross supply of doctorates to be produced in California, consideration must be given to the proportion who actually

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[6] *Ibid*, p. 50.

[7] Louis H. Conger and Marie G. Fullam, *Projection of Earned Degrees to 1969–1970*. Washington, U. S. Department of Health, Education, and Welfare, September 1959, p. 4.

Table 29

Estimated Net Supply of Holders of Doctoral Degrees to Be Produced in California, 1959–1975 Based on Institutional Projections,[1] and Comparison with Demand, 1959–1975

1		2		3		4		5		6
Gross Supply Produced		Entering Higher Education[2]		Placed in California (Net Supply)[3]		Net Direct Supply Needed[4]		Net Over-Supply or Shortage		Index of Supply to Demand
Total	Annual Average	Total	Annual Average	Total	Annual Average	Total	Annual Average	Total	Annual Average	
34,679	2,040	11,097	653	5,881	346	5,702	335	+179	+11	1.03

[1] These figures are based on replies to questionnaires sent to the heads of all California independent institutions presently offering the Ph.D. degree and to the chief administrative officers of all campuses of the University of California. These estimates were for the academic years 1960–61, 1965–66, 1970–71, and 1975–76. Straight-line projections were made for the intervening years. In all cases the estimates were scrutinized and tacitly approved by these officers, so that they should reflect any possible policy of expansion of staff or facilities and not just the hopes of department chairmen. The projections are for the years 1958–59 to 1974–75, since these are the graduates who will be available to teach in 1959–60 to 1975–76.

[2] The percentage used is 32 per cent and is based on data taken from the NEA Study of Teacher Demand and Supply in Colleges, Universities, and Junior Colleges for 1957–58. It is only those who enter—not those who continue in college teaching, since they have already met a need before the degree is granted.

[3] Predicted on a proportion equal to 53.8 per cent remaining in California. This figure is derived from questionnaires sent to placement officers of California institutions that award the doctorate (see Table 31).

[4] Taken from Table 28, column 7.

enter teaching in California. This number (5,881) is presented in Column 3 of Table 29. The figure is derived by reducing the total supply (34,679) to the number who can be expected to teach in California institutions. The percentages entering college teaching, and of that group, the proportion remaining in California, are derived from data presented in Tables 30 and 31. Table 30 shows the number and percentages of those receiving doctorates in California in 1956–57 and 1957–58 who entered or continued in college teaching. Since only those *entering* fill a need, that percentage (32 per cent) has been used in these computations. Table 31 gives the number and percentage of California graduates entering college teaching who do so in California (53.8 per cent of holders of the doctoral degree and 72.2 per cent of those with the master's degree).

Table 29, then, presents the net supply of California-prepared doctorates who could be expected to enter college teaching directly on the basis of the institutional estimates. This computation is, of course, dependent on the assumptions on which it rests:

1. That the proportion of California-trained doctor's degree holders who enter college teaching will be constant.
2. That the proportion of this number remaining in California will continue as in the past.

Comparison of Projected Supply and Demand. Table 29 also includes in Column 4 the net demand required for doctorates to be produced by California institutions and compares that demand with the actual supply that should be available. It can be seen from the figures in Column 5 and the index in Column 6 that supply and demand will be in a position of approximate balance over the period up to 1975, granting the production of doctorates that has been estimated.

The fact that demand and supply balance for the total period 1959–1975, however, does not tell the complete story. Table 32 presents a comparison of supply and demand similar to that in Table 29, except that the total period is broken down into smaller segments. This analysis indicates that up to 1965 California's institutions of higher education will be in a period of faculty shortage, the index of supply to demand being .67 for 1959–1960 and .85 for 1961–1965. In the period 1966–1970, supply and demand should be in approximate balance, and during the final five-year period covered by this study, a surplus should exist.

Because of lack of necessary data, it has been impossible to develop any systematic analysis of the relationship between supply and demand for specific subject fields. In lieu of such an analysis, the opinions of a large group of placement officers of colleges and universities preparing college teachers were obtained by a nation-wide survey. This informa-

Table 30

Proportion of Recipients of Doctoral Degrees from California Institutions[1] Who Continued in or Entered Higher Education,[2] by Subject Field, 1956–57 and 1957–58

Subject Field	Total Doctorates Reported	Number Continuing Teaching	Number Entering Teaching	Per Cent Continuing or Entering Teaching	Per Cent Continuing Teaching	Per Cent Entering Teaching
Agriculture	67	14	25	58.2	20.9	37.3
Biological Sciences	225	47	107	68.4	20.9	47.5
Business and Commerce	5	4	1	100.0	80.0	20.0
Education						
Ph.D.	59	16	18	57.6	27.1	30.5
Ed.D.	197	48	53	51.3	24.4	26.9
Engineering	156	5	55	38.5	3.3	35.2
English and Journalism	52	37	12	94.2	71.1	23.1
Fine Arts						
Music	8	6	0	75.0	75.0	0.0
Speech	38	28	5	86.8	73.6	13.2
All Other	3	1	2	100.0	33.3	66.7
Foreign Languages	52	32	12	84.6	61.5	23.1
Geography	7	1	6	100.0	14.3	85.7
Health Professions	10	1	4	50.0	10.0	40.0
Home Economics	8	5	2	87.5	62.5	25.0
Library Science	1	1	0	100.0	100.0	0.0
Mathematics	58	3	29	55.2	5.2	50.0
Philosophy	10	4	5	90.0	40.0	50.0
Physical Education and Health	4	3	0	75.0	75.0	0.0
Physical Sciences						
Chemistry	165	17	53	42.4	10.3	32.1
Geology	37	5	7	32.4	13.5	18.9
Physics	119	24	18	35.3	20.2	15.1
All Other	40	7	14	52.5	17.5	35.0
Psychology	86	4	38	48.8	4.6	44.2
Religion	12	1	2	25.0	8.3	16.7
Social Sciences (Basic)						
Economics	50	39	4	86.0	78.0	8.0
History	63	36	20	88.9	57.2	31.7
Political Science	36	16	13	80.6	44.5	36.1
Sociology	15	12	1	86.7	80.0	6.7
All Other	9	0	7	77.8	0.0	77.8
Social Sciences (Applied)	15	6	3	60.0	40.0	20.0
Miscellaneous	4	4	0	100.0	100.0	0.0
Total	1,611	427	516	58.5	26.5	32.0

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[1] Survey includes California Institute of Technology; College of the Pacific; Stanford University; University of California, Berkeley; University of California, Los Angeles; and University of Southern California.

[2] Includes those in college teaching, research, and administration.

SOURCE: *Teacher Supply and Demand in Universities, Colleges, and Junior Colleges, 1957–58 and 1958–59*, Washington, D.C., National Education Association, Research Report 1959 R10, June, 1959. The total number of doctorates reported is somewhat less than the 1,730 awarded in this period because of incomplete reporting by the schools and the absence from the list of a few institutions granting doctorates.

Table 31

Percentage of Placements of California's Graduate Degree Holders in College Faculty Positions Within and Without the State by Degree and Subject Field, 1955–56, 1956–57, and 1957–58[1]

Subject Field	Number of Placements of Holders of Doctoral Degrees			Number of Placements of Holders of Master's Degrees		
	In-State	Out-of-State	Total	In-State	Out-of-State	Total
Agriculture	1	0	1	1	0	1
Arts and Crafts	3	1	4	31	19	50
Biological Sciences	15	19	34	12	5	17
Bus. Ad., Bus. Ed., and Commerce	3	3	6	28	3	31
Chemistry	8	3	11	16	1	17
Economics	3	2	5	9	4	13
Education	36	30	66	50	15	65
Engineering	1	2	3	8	1	9
English, Speech, and Dramatic Arts	33	32	65	66	39	105
Geology	0	0	0	5	2	7
German	3	7	10	4	7	11
History	33	31	64	25	18	43
Home Economics	1	0	1	8	1	9
Industrial Arts	0	1	1	4	0	4
Journalism	0	0	0	2	1	3
Mathematics	7	2	9	26	1	27
Music	3	3	6	10	8	18
Philosophy	3	2	5	2	3	5
Physical Education and Health	8	1	9	41	11	52
Physics	2	1	3	16	0	16
Political Science	12	6	18	13	4	17
Psychology	9	9	18	19	2	21
Romance Languages	7	7	14	15	7	22
Sociology	10	7	17	6	10	16
All other fields	6	9	15	25	8	33
Total	206	177	383	442	170	612
Per Cent	53.8%	46.2%	100.0%	72.2%	27.8%	100.0%

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[1] The 1955-56 data are based on replies to a Joint Staff questionnaire of June 24, 1957, sent to California college and university placement officers. Those for 1957-58 and 1958-59 are based on a questionnaire of September 21, 1959. For the questionnaire dated June 24, 1957, replies were received from five state colleges, three University of California campuses, and ten private colleges and universities. For the September 21, 1959, questionnaire, replies were received from eleven state colleges, five University of California campuses, and fifteen independent colleges and universities.

Table 32

Comparison of Demand and Supply of Doctoral Degree Holders for California Institutions of Higher Education, by Selected Time Periods, 1959–1975

Time Period	1	2	3	4	5	6	7	8	9
	Demand					Supply[1]			
	Total Demand[2]	Out-of-State[3]	In-State[4]	Net Direct Demand[5]	Direct Demand for California Doctorates[6]	Total Production[7]	Net Supply[8]	Net Surplus or Shortage	Index of Supply to Demand
1959–60	4,878	2,927	1,951	1,288	502	1,995	338	−164	.67
1961–65	14,227	8,536	5,691	3,756	1,465	7,313	1,240	−225	.85
1966–70	16,839	10,103	6,736	4,445	1,734	10,713	1,817	+83	1.05
1971–75	18,480	11,088	7,392	4,879	1,903	14,658	2,486	+583	1.31
Total	54,424	32,654	21,770	14,368	5,604[9]	34,679	5,881	277[9]	1.05[9]

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[1] This is the supply available for the academic years 1959–60 to 1975–76, which means that it is the projected production for the years 1958–59 to 1974–75.

[2] Total taken from Table 21, Part B.

[3] 60 per cent of column 1.

[4] 40 per cent of column 1.

[5] 66 per cent of column 3. This percentage is the proportion left after taking into account the deferred supply of 34 per cent.

[6] 39 per cent of column 4.

[7] These figures have been calculated from the institutional projections presented in Table 11. The estimates for the various time periods are extrapolations, using direct-line projections, of the reported figures for 1958–59, 1960–61, 1965–66, 1970–71, and 1975–76.

[8] 16.9 per cent of column 6. This percentage is the amount by which the total is reduced to account for those awarded doctorates who do not go into college teaching (68 per cent) and those who go into teaching, but outside California (47 per cent).

[9] Totals do not agree with those in columns 4, 5, and 6 of Table 29, because of independent rounding of percentages.

Table 33

Opinions Expressed Concerning Supply of College and Junior College Teachers, by Subject Fields, Fall 1959

Subject Field	Junior College				College and University			
	Total Replies	Per Cent Who Thought This Field to Be:			Total Replies	Per Cent Who Thought This Field to Be:		
		Over-Supplied	Balanced	Under-Supplied		Over-Supplied	Balanced	Under-Supplied
Agriculture	26	27%	57%	15%	37	22%	54%	24%
Arts and Crafts	46	26	39	35	63	21	44	35
Biological Sciences	62	5	43	52	77	5	49	46
Business Administration and Education	54	7	41	52	72	6	30	64
Chemistry	61	1	7	92	75	0	11	89
Commercial Arts	43	23	42	35	39	18	52	30
Dramatic Arts	48	29	50	21	61	31	46	23
Economics	52	10	65	25	72	6	61	33
Education	45	11	40	49	80	4	26	70
Engineering	49	..	10	90	69	..	13	87
English, Speech	59	10	31	59	82	13	34	53
Geology	46	28	44	28	63	16	51	33
German	50	4	42	54	74	..	51	49
History	58	57	41	2	76	59	37	4
Home Economics	52	6	35	59	70	1	26	73
Industrial Arts	44	14	43	43	58	12	53	35
Journalism	48	9	58	33	62	10	56	34
Mathematics	62	2	2	96	83	1	2	97
Music	55	38	40	22	71	41	41	18
Philosophy	47	30	60	10	66	21	64	15
Physical Education and Health[1]								
Women's	17	6	18	76	23	13	..	87
Men's	16	87	13	..	25	80	12	8
Not Segregated	42	71	17	12	58	55	26	19
Physics	62	..	5	95	81	..	1	99
Political Science	59	32	56	12	77	17	68	15
Psychology	57	16	49	35	76	9	49	42
Romance Languages	58	5	33	62	79	5	33	62
Sociology	56	21	66	13	74	11	66	23

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[1] Some respondents reported separately on men's and women's physical education. Others did not.

Note: The opinionnaire was sent to placement officers of 122 colleges and universities in the United States that prepare junior college, college, and university teachers. Eighty-eight replies were received, or 72 per cent of those to whom opinionnaires were sent.

tion was collected separately for the supply of teachers for junior colleges, and for other colleges and universities, and the results are presented in Table 33.

The fields that stand out in this table as having the greatest undersupply in 1959 are chemistry, engineering, home economics, mathematics, physics, and women's physical education. Since the supply in the other fields appears to be more adequate, it is reasonable to assume that the situation in these current shortage fields may be more critical than the totals would suggest.

Supply of "Credentialed" Personnel for Junior Colleges. The replies to the questionnaire inquiring into new or expanded programs of junior college teacher training indicate that there is a great deal of interest among California colleges and universities in preparing more and better trained teachers for this segment of higher education.

Of the twenty-one institutions to which the questionnaire was sent, all but six had new developments in this field to report, and three of these reported recent study and interest in improvement. In brief, ten institutions have initiated new programs and five have appointed new staff with special qualifications and responsibility in the field of junior college education. Several institutions have modified their existing programs with the idea of either upgrading existing junior college teachers in teaching fields, improving pre-teaching programs or appealing to new sources of candidates. Three institutions are utilizing the internship plan of teacher education.

These enlarged programs, when combined with the apparently adequate supply of master's degree holders in the period up to 1975 and the supply available from the high schools, indicate that the over-all staffing problems in the junior colleges should not be insurmountable. Undoubtedly, however, the situation regarding the shortage fields (chemistry, mathematics, engineering, physics, and women's physical education) will be difficult to remedy promptly.

Summary of Major Findings and Recommendations

Before proceeding to sum up findings and present recommendations, it would be appropriate to point once again to the importance of the assumptions that have operated in this analysis. The findings are valid only if the assumptions are correct. In the event that they are, however (and the evidence available in the preparation of this study indicates that they are), the findings should be reasonably accurate.

It must also be pointed out that the demand presented in this study takes into account only those state colleges and University campuses existing and presently authorized. The establishment of new campuses other than these will create some additional need because of the effect on college attendance in their immediate areas. On the other hand, the effect on supply that will be brought about by the additional state colleges and University campuses presently authorized has not been taken into consideration.

Major Findings. The major findings of the Committee are as follows:

1. In order to meet the needs of the enrollments projected for California institutions of higher education between 1959 and 1975, a total of 54,424 new full-time faculty members (an average of 3,201 per year) will have to be recruited. Of these 29,280 (or 54 per cent) will be needed because of enrollment increases, and 25,144 (or 46 per cent) will be needed as replacements due to death, resignation, and retirement.

2. The greatest numbers of new faculty will be required by the state colleges (20,168), followed by the junior colleges (14,711), the University of California (12,533), and the independent colleges and universities (7,012).

3. A large proportion of the newly appointed full-time faculty of all segments of public higher education in California receive their highest degrees from institutions outside the state. For 1957–58 and 1958–59, 1,127 (57.3 per cent) of a total of 1,966 new faculty fell into this category. The proportions, by segment, were: junior colleges, 52.5 per cent; state colleges, 52.6 per cent; and University of California, 76.2 per cent.

4. Of the new full-time appointees to both the state colleges and the University of California possessing doctoral degrees, the largest number of such degrees were awarded by the University of California. Of the new faculty appointed by the University from 1954 through 1958, 18.9 per cent received their highest degree from that institution and 15.5 per cent of those appointed by the state colleges obtained doctoral degrees at the University of California. Other institutional sources of supply are quite different, however, for the two segments. For the University, the second to fifth place sources are Harvard (11.8 per cent), Chicago (4.8 per cent), Yale (4.8 per cent), and Michigan (4.4 per cent). The equivalent sources for the state colleges are Stanford (8.2 per cent), University of Southern California (6.7 per cent), Columbia University (4.3 per cent), and University of Washington (4.0 per cent).

5. The occupational sources of supply also vary among the segments. The two major sources for all segments are teaching and graduate school, with the remainder coming from business, industry, research, government, and miscellaneous sources. For the years 1957–58 and 1958–59 the junior colleges obtained 70 per cent of their faculty from teaching and 11 per cent from graduate schools, and for the years 1954

through 1958 the state colleges secured 63 per cent from teaching and 12 per cent from graduate schools, and the University of California, 38 and 34 per cent, respectively.

6. A significant proportion of the new faculty of all three segments of public higher education is obtained from a "deferred" supply—that is, persons who do not go directly into college teaching from graduate school but later enter that profession. Fifty-two per cent of the junior college faculty, 24 per cent of the state college faculty, and 28 per cent of the University of California faculty are estimated to have been obtained from this source during the period studied.

7. For all three public segments, approximately 40 per cent of the new full-time faculty appointed held the doctorate at time of appointment, 45 per cent the master's degree, and 15 per cent various other degrees or no degree. The doctorate was held by 9 per cent of the new appointees of the junior colleges, 40 per cent of those of the state colleges, and 70 per cent of those of the University of California.

8. The number of doctoral degrees awarded by California institutions is expected to increase from the 865 awarded in 1958–59 to a total of 3,375 per year in 1975, an increase of 290 per cent. The projections for the University of California amount to an increase of 444 per cent, whereas those for the independent colleges and universities amount to an increase of 125 per cent. The total number of doctorates produced between 1958–59 and 1974–75 at this level of increase will be 34,679. (This finding, calculated from Table 11, Section IV, is included here because of its relevance to faculty demand and supply.)

9. Approximately 32 per cent of the holders of doctorates awarded by California institutions enter higher education teaching for the first time, whereas another 26 per cent of such degree holders are already engaged in teaching and continue in that profession. Of these California-awarded doctorates entering higher education teaching approximately 53 per cent do so in California. The remainder are lost to other states.

10. There is general agreement among college placement officers that the fields of greatest current shortage of college teachers are chemistry, engineering, home economics, mathematics, physics, and women's physical education. Similarly, the fields of most adequate supply appear to be history and men's physical education.

Conclusions. The major conclusions of the Committee are as follows:

1. If the current sources of supply remain available in the same proportion as in the past, the total supply of and demand for doctorates to staff California's system of higher education in the same proportion as in the past should be in a position of approximate balance over the period from 1959 to 1975.

2. Despite this over-all balance, the next period 1959–1966 will probably be a period of relative short supply of adequately trained persons to staff the state's institutions of higher education. This immediate shortage is caused by the time lag that exists between the influx of the large enrollments into the colleges and universities of the nation and the time this influx is felt in the production of doctoral degrees. A seven-year lag is used by the U.S. Office of Education for the projection of doctorates.

Recommendations. The recommendations of the Committee are as follows:

1. *Much greater effort be made to divert a greater proportion of college graduates into graduate training preparatory to careers in college and university teaching. This diversion can best be accomplished by a concerted effort on the part of adequately staffed and supported counseling and guidance services at all levels of education, and with the full cooperation of all college and university faculty members.*

2. *More funds be secured to provide financial assistance to those in graduate training. The high attrition rate in graduate programs is, in large part, due to financial difficulty; and these withdrawals constitute not only a loss to the potential faculty supply but an economic waste to the state. Provision of fellowship and loan funds for graduate students is undoubtedly one of the best ways of reducing the attrition rate.*

3. *Greatly increased salaries and expanded "fringe benefits," such as health and group life insurance, leaves, and travel funds to attend professional meetings, housing, parking and moving expenses, be provided for faculty members in order to make college and university teaching attractive as compared with business and industry.*[8]

4. *Greater use be made of California-trained doctoral degree holders, especially in the shortage years immediately ahead. For the three-year period 1955–58 only 53 per cent of those so trained who entered teaching did so in California. Evidence indicates that those leaving California do not do so by choice.*[9]

5. *Individual faculty members and their institutions jointly assume responsibility for both the initiative and opportunity for the faculty*

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[8] As an example of the wide differences, of forty-four persons awarded Ph.D.'s in shortage fields by the University of California in 1959, thirty-one accepted positions in industry at an average salary of $9,884 and thirteen went into college teaching at an average salary of $6,075.

[9] Of forty-four doctor's degree holders recently placed in college and university teaching outside California by the School and College Placement Service of the University of California at Berkeley, 87 per cent had stated a preference for a position in California.

inservice preparation and self-improvement so essential for the growth and development of the institutions.

6. *Strengthening of the master's degree programs in all institutions offering such programs be undertaken by these institutions so that the holders of this degree may be more effective additions to the faculties of colleges, universities and junior colleges.*[10]

7. *Reorientation of present doctoral programs offered by California institutions be undertaken to insure that those receiving the degree and planning to enter college and university teaching possess the qualities not only of scholars, but of scholar-teachers. Because the University of California awarded 54.6 per cent of the doctorates given by California institutions for the period 1952–53 to 1955–56, it has a particular responsibility for the implementing of this recommendation.*

8. *Because of the continual change in faculty demand and supply, the coordinating agency annually collect pertinent data from all segments of higher education in the state and thereby make possible the testing of the assumptions underlying this report.*[11]

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[10] This is of particular importance to the junior colleges because the highest degree held by 64.7 per cent of those newly appointed in the years 1957–58 and 1958–59 was the master's degree. Although all institutions in the state should cooperate in this effort, the lead should be taken by the state colleges and the University of California because of the high proportion of all such degrees they award.

[11] The 1958 report, prepared by the Joint Staff for the Liaison Committee and entitled, *A Study of Faculty Demand and Supply in California Higher Education, 1957–1970*, contains a recommendation, approved by both boards, for its re-examination in 1960. A similar procedure should be followed with respect to this analysis.

Appendix I

POSSIBLE NEW STATE COLLEGES AND PROBABLE EFFECTS OF SUCH COLLEGES UPON EXISTING ONES

A major concern of the Technical Committee on Institutional Capacities and Area Needs is the need for new institutions of higher education in California. This appendix supplements the information found in Section IV and deals more specifically with enrollment estimates for potential new state colleges and the probable impact of their establishment on existing institutions.

General Method of Estimating Enrollment Potential

The general method employed to estimate potential enrollment in possible new state colleges may be described as one based upon zones of primary enrollment potential, or commuting zones, surrounding assumed locations of possible new state colleges. The term "commuting zones" is not meant to imply that all public high school graduates in California can or should be within commuting distance of a state college. Rather, it is a technique for estimating the probable enrollment that new state colleges in metropolitan or other areas might achieve by 1970 or 1975, if established. The advantage of the method is that it considers the projected future numbers and geographic concentration of public high school graduates that are the primary enrollment base of possible new state colleges.

In previous studies of the need for new state colleges the general method involved rates of freshmen per 1,000 high school graduates of the assumed county of location and other adjacent counties.[1] This method did not adequately recognize the variable of relative geographic concentration and location of such high school graduates within the various counties, and the variable distances of such high school graduates from the assumed location of a possible new state college.

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[1] Semans and Holy, *op. cit.*, Chapter IV and Appendix C.

All existing state colleges draw students from many different counties in California, and some colleges, such as California State Polytechnic and San Jose, are statewide in their service; however, most existing state colleges primarily serve students in the several counties of the immediate region surrounding the colleges. Therefore, as the Technical Committee considered the entire state with regard to possible need for additional state colleges by 1975, the primary consideration was to determine which areas of the state, if any, had large estimated numbers of future high school graduates in 1969–70 or 1974–75 in relatively concentrated geographic areas, outside the effective service areas of existing state colleges.

When numbers of projected public high school graduates in the magnitude of about 4,000–5,000, or more, are estimated for 1974–75, within an area of roughly a thirty-mile radius from a central point that lies some distance from an existing or authorized state college, then the area probably has a potential enrollment in 1975 that approaches or exceeds the 3,000 full-time students recommended by this Committee as a minimum for the establishment of a new state college.

Experience at existing state colleges indicates that rates of attendance of high school graduates beyond thirty miles or more from a college are relatively low compared to high school graduates who live closer to the college. In the light of this fact it may be that high school graduates in areas with small enrollment potential can be served most efficiently by providing dormitories at existing colleges and scholarships, which include subsistence provisions, for capable and needy students to attend institutions at some distance from their homes. It is obviously beyond the ability of the state to provide public four-year colleges within commuting distance of all high school graduates. However, the state in cooperation with local communities can more nearly hope to provide the opportunity for two years of education beyond the high school in local public junior colleges to most high school graduates, from which successful students who desire to do so may transfer to four-year institutions.

The primary enrollment or commuting zone concept also recognizes that a new state college, located to serve the maximum number of potential students in an area (assuming the potential meets the minimum size warranted by unit cost factors), will enhance educational opportunity by enabling students to attend at the least cost in terms of room and board and in terms of travel time and distance. It is also likely that a new state college so located will serve the maximum number of part-time students or persons with specialized training needs in the community, within the facilities provided for the full-time or regular enrollment.

Table 34

Estimates of Fall 1970 and Fall 1975 Full-Time Enrollment Potential for Possible New State Colleges[1]

New State College Areas	Assumed Locations	Commuting Zones (Miles)	1969-70 Public High School Graduates	1970 Enrollment	1974-75 Public High School Graduates	1975 Enrollment
San Bernardino-Riverside Area	Colton	0-10	8,821		12,332	
		11-20	1,180		1,674	
		21-30	1,169		1,588	
			11,170	9,200	15,594	12,800
San Mateo County	Redwood City	0-10	10,609		13,834	
		11-20	136		168	
		21-30	45		56	
			10,790	8,000	14,058	10,500
Contra Costa County	Walnut Creek	0-10	3,780		3,402	
		11-20	560		504	
		21-30	2,450		2,205	
			6,790	4,600	6,111	4,200
Kern County	Bakersfield	0-10	3,268		3,258	
		11-20	......		......	
		21-30	562		559	
			3,830	3,100	3,817	3,100
Monterey Bay Area	Castroville	0-10	1,561		1,831	
		11-20	885		1,039	
		21-30	1,135		1,388	
			3,581	2,400	4,258	2,900
Ventura County	Between Ventura and Oxnard	0-10	1,957		1,950	
		11-20	729		726	
		21-30	1,393		1,388	
			4,079	2,800	4,064	2,800
San Joaquin County	Stockton	0-10	1,748		1,613	
		11-20	987		912	
		21-30	238		213	
			2,973	2,300	2,738	2,200
Napa-Solano Area	Napa Y	0-10	1,890		1,878	
		11-20	518		533	
		21-30	268		261	
			2,676	2,100	2,672	2,100

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[1] The Los Angeles area is not included here but its need for new state colleges appears in a later table.

In Table 34 projected public high school graduates in the primary enrollment areas of possible new state colleges are shown for both 1970 and 1975. The high school graduates by zone are shown for both years to indicate relative growth or lack of growth, with resulting increases or leveling off of enrollment potential for each possible new state college. Another consideration with regard to the number and concentration of high school graduates is the principle that the enrollment base should be large enough so that establishment of a new state college would not have a drastic effect upon other existing institutions in the area, such as junior colleges or independent colleges.[2]

In assessing relative needs for additional state colleges it must be remembered that size of enrollment potential, although a very important factor, is not the only factor that must be considered in establishing priorities of need. Where different areas of the state may have similar potential state college enrollments, some areas may contain several four-year institutions, either public or private. In addition, priority of need must consider the enrollment capacity of existing institutions, and particularly existing state colleges, with regard to capacity in terms of site limitations or policy standards, or both. Also to be considered are relative time-tables of establishments where some areas are growing faster than others, as well as the time lag between authorization, financing, building, and occupancy of facilities in certain target years.

The rates of freshmen and expansion factors presented below and used to estimate potential enrollments in possible new state colleges are based upon experience at existing state colleges with full four- and five-year programs. If lower division limitations, changes in admission or transfer requirements, or other changes are made which would affect enrollment potential in existing or new state colleges, then the estimated enrollment potentials would have to be re-examined.

Specific Description of Commuting Zone Method

This method of estimating enrollment potential at possible new state colleges regards the enrollment base of public high school graduates as the primary factor. High school graduates are considered in both their magnitude and their relative geographic concentration, without regard for artificial political boundaries. The method is based upon experience at existing state colleges in terms of rates of first-time regular freshmen per 1,000 public high school graduates in successive ten-mile zones surrounding the various colleges. Expansion factors for continuing, returning, and freshman transfers, as well as allowance for first-time freshmen from outside the thirty-mile commuting zones, are used to estimate total freshman enrollment. Total regular freshman enrollment is then expanded to full-time enrollment at all class levels.

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[2] *Ibid.*, pp. v–vi.

The rates of first-time freshmen and expansion factors used are a composite of the most recent two years' experience at Fresno, San Diego, San Jose, Long Beach, Sacramento, and San Francisco State Colleges. The two state colleges serving junior college functions (Chico and Humboldt) are excluded as are the two California State Polytechnic campuses, which serve somewhat specialized functions. Also, the quite new state colleges without stabilized experience rates were excluded (Los Angeles and San Fernando).

The state colleges upon whose experience the method is based include both metropolitan and nonmetropolitan areas and reflect in their rates of first-time freshmen, and expansion factors, the influence of junior colleges, private colleges, and University of California campuses in their areas. The use of standard composite rates and factors based on the selected six state colleges mentioned above allows the magnitude and concentration of high school graduates to be clearly reflected in the size of estimated enrollment potential for each possible new state college. Similarly, the estimated numbers of high school graduates in high school districts or schools within a thirty-mile radius of the assumed location of possible new state colleges (or one-half the distance to the nearest existing state college), without regard for county boundaries, again allows the appropriate high school graduate base to exert the primary influence upon the estimated potential enrollments.

It was not deemed advisable to attempt to relate each possible new state college to one specific existing state college and, therefore, to use the rates and factors from that isolated experience, since the assumption of such similarity may be quite misleading. In addition, such an assumption would result in variations in estimated enrollment for different new state colleges that would be the result of assumed identity with an existing one, rather than the relative population composition and concentration reflected in projections of public high school graduates.

The rates of first-time freshmen per 1,000 public high school graduates of the prior academic year as thus derived for successive ten-mile zones are 125, 95, and 50. First-time freshmen from within the commuting zones are in general doubled to allow for continuing, returning, and transfer enrollment (about 30 per cent) and to allow for first-time freshmen from outside the commuting zones (about 10–20 per cent). Finally, estimated total freshman enrollment of regular students (those taking seven or more units) is multiplied by a factor of 3.6 to estimate full-time enrollment (twelve or more units) at all class levels for the target year.

Estimates of public high school graduates by high school district were made within county or College Enrollment Area totals projected for 1974–75 by the State Department of Finance, on the basis of actual 1957–58 distributions by district or upon observed trends by district from 1951–52 to 1957–58. Assumed locations for new state colleges were selected to maximize the number of projected high school graduates within the commuting zones which is in accord with Principle 5 in the *Additional Centers Study* quoted earlier in this report.

Estimated Enrollment at New State Colleges

Table 34 summarizes the 1970 and 1975 full-time enrollment potential estimated for new state colleges, except for those in Los Angeles County, and shows the estimated numbers of public high school graduates in each of three ten-mile zones for each possible college. The various areas are listed in descending order of estimated 1975 enrollment potential.

There is a considerable drop in estimated enrollment potential in 1975 between the first two areas, San Bernardino and San Mateo, and other possible state college locations. Also, of the possible new state colleges in this list, four show estimated 1975 full-time enrollment potentials below the 3,000 minimum recommended by this Committee.

Table 35 gives the estimated 1975 full-time enrollment for two possible additional state colleges in Los Angeles County. Part A of this table shows the 1974–75 estimated number of public high school graduates for College Enrollment Area 12 within the primary enrollment area of each of the five existing state colleges (CEA–12 a–e). The distribution of public high school graduates in CEA–12 by sub-area in 1974–75 reflects observed trends in school enrollment. For example, the proportion of high school graduates in CEA–12b is decreasing, while the proportion in CEA–12a and CEA–12d is increasing. Part A also shows the rates of first-time freshmen per 1,000 public high school graduates from each sub-area to the state college within each area, the number of first-time freshmen, and the relationship of total first-time freshmen to total full-time enrollment at all class levels in 1975. The rates and factors in Part A of this table are based in general upon the *status quo* projections for existing colleges from the Department of Finance.

Part B of Table 35 also shows estimated 1975 full-time enrollments at new state colleges in the Inglewood (in Section IV this area is referred to as "in the vicinity of the Los Angeles International Airport") and Glendale areas of Los Angeles County. Part B also indicates the estimated shift in enrollment potential between several of the existing state colleges and the two possible new state colleges.

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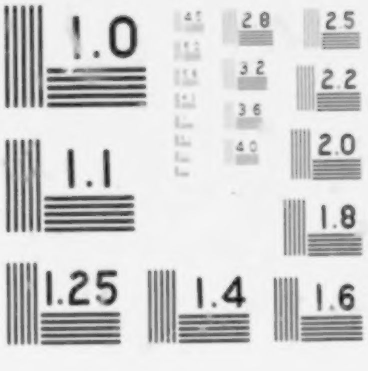
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963

Table 35

Two Possible Additional State Colleges in Los Angeles County With Estimated Enrollment and Effect Upon Existing State Colleges in the Area in 1975

State Colleges	CEA 12	1974-75 Public High School Graduates	First-Time Freshmen		Full-Time Enrollment	
			Per 1,000	Number	Factor	Number
A. Existing State Colleges—Status Quo						
San Fernando State.....	a	30,138	125	3,767	4.80	18,100
Los Angeles State.......	b	53,221	100	5,322	5.36	28,550
Long Beach State.......	c	42,125	106	4,462	5.56	24,850
California Polytechnic, Kellogg-Voorhis......	d	11,507	125	1,438	......	....
(From San Bernardino).	...	(14,941)	(50)	(747)	......	....
				(2,185)	7.18	15,700
Orange County State....	e	16,932	100	1,693	5.84	9,900
Total...............	...	153,923	108	16,685[1]	......	....
		......	....	(17,432)	5.57	97,100
B. Assuming New State Colleges in Inglewood and Glendale Areas						
San Fernando State.....	a	15,069[2]	130	1,959	5.00	9,800
Glendale Area..........	a-1	20,221	115	2,325	5.40	12,600
Los Angeles State.......	b	25,546[3]	115	2,938	5.40	15,900
Inglewood Area.........	b-1	35,161	105	3,692	5.40	19,900
Long Beach State.......	c	29,487[4]	115	3,391	5.50	18,600
California Polytechnic, Kellogg-Voorhis......	d	11,507	125	1,438	......	....
(From San Bernardino)..	...	(14,941)	(10)[5]	(149)	......	....
		......	...	(1,587)	7.00	11,100
Orange County State....	e	16,932	100	1,693	5.80	9,900
Total...............	...	153,923	114	17,436[6]	5.56	97,800[7]
		......	...	(17,585)	......	....

[1] Computed at a rate of 108 per 1,000 of high school graduates.

[2] High school graduates in this sub-area reduced 15 per cent and 35 per cent for Inglewood and Glendale State College areas, respectively.

[3] High school graduates in this sub-area reduced 34 per cent and 18 per cent for Inglewood and Glendale State College areas, respectively.

[4] High school graduates in this sub-area reduced 30 per cent for Inglewood State College area.

[5] Rate reduced assuming new state college in San Bernardino County.

[6] Computed at a rate of 114 per 1,000 of high school graduates.

[7] Increase in net enrollment includes 4,600 from California Polytechnic, Kellogg-Voorhis, or a total of 5,300.

Past experience with new state colleges is that in general they tap a potential of new students, due to proximity, who otherwise would not have attended a state college. This means in general a substantial increase in rate of high school graduates attending state colleges for any area where a new state college is located. It has also meant in general that a certain rate of high school graduates continue to attend other state colleges from such an area, even after one is established in the immediate vicinity. In other words, past experience indicates that rates of attendance at existing state colleges have not been drastically lowered by the establishment of a new state college in areas some distance from existing state colleges.

However, in the Los Angeles Area (CEA–12), this generalization is not believed applicable. All high school graduates of Los Angeles and Orange Counties are at present included in the enrollment base to which the State Department of Finance has applied rates of first-time freshmen to project enrollment at the five existing state colleges in the area. The establishment of additional state colleges in this immediate area (CEA–12) will probably result primarily in a redistribution of enrollment potential already included in projections for the existing state colleges of the area. This seems likely since all high school graduates in the primary enrollment area of each existing state college (CEA–12 a, b, c, d, and e) have had a corresponding rate of first-time freshmen applied throughout each sub-area (about 100–125). In other words, there is no necessity to apply a decreasing rate for distance where practically all high school graduates are within ten or fifteen miles of an existing state college.

There will undoubtedly be a small increase in the rate of first-time freshmen attending state colleges in areas where a new state college is established in CEA–12 in immediate proximity to students previously at some distance in terms of travel time from existing colleges. However, any sizeable increase in rate of attendance over that already projected for existing state colleges in the Los Angeles area is not foreseen. Thus, Table 35 reflects for State Economic Area F essentially a shift in enrollment potential from existing state colleges to the two possible new state colleges in the Inglewood and Glendale areas, with only a slight increase in total state college enrollment potential in the Los Angeles area. The selection of the Inglewood and Glendale areas as assumed locations for possible new state colleges was based upon both distance to existing state colleges and upon the excess of enrollment projections over site capacity for San Fernando Valley State, Long Beach State, and particularly for Los Angeles State College.

Estimated Effect of New State Colleges Upon Existing State Colleges

Establishment of a new state college in San Mateo County would have an appreciable effect upon enrollment potential at San Jose State and particularly upon San Francisco State. There would also be some effect upon potential enrollment at the new Alameda State College.

Although the estimated 1975 full-time enrollment potential of 10,500 for a new state college in San Mateo County is large, it is estimated that establishment of such a new college would not increase the rate of attendance of San Mateo County high school graduates to state colleges by more than about 20 per cent. Since San Mateo County high school graduates are within commuting distance of San Jose State, San Francisco State, and to some extent to Alameda State, the rate of attendance of first-time freshmen from San Mateo County to all state colleges is already relatively high as shown in Table 36.

It is apparent from Table 36 that counties with very low rates, such as Kern and San Bernardino, could expect a very substantial increase in the rate of freshmen attending state colleges if new state colleges were established within such counties. It is also apparent that there is considerable variation in the rates of freshmen both among counties with existing state colleges and counties without state colleges.

Table 37 shows the estimated effect upon 1975 enrollment potential at San Francisco State College if new state colleges were established in San Mateo and Contra Costa Counties. The estimated decrease in total 1975 full-time enrollment at San Francisco State is 30 per cent or from 8,200 to 5,754 in 1975. This reduction would be due primarily to the establishment of a new state college in San Mateo County.

Table 38 shows the estimated effect upon enrollment potential at San Jose State College in 1975, if new state colleges were established in both San Mateo and Contra Costa Counties. Footnote "a" in this table points out the assumption that enrollment at San Jose State would be decreased not only because of fewer students from San Mateo County, but also because some 23 per cent of Santa Clara County high school graduates would be closer to the assumed location of a new state college in San Mateo County than to San Jose State. The estimated decrease in total 1975 full-time enrollment at San Jose State is 22.7 per cent, or from 24,900 to 19,200. Again, the primary influence in this reduction would be the establishment of a new state college in San Mateo County.

Table 39 shows the estimated effect upon enrollment potential at Alameda County State College. This amounts to 19 per cent in 1975. Again the influence of a new college in San Mateo County is primary. This estimated reduction might well be counterbalanced, however, by a slight increase in rates of attendance of first-time freshmen from Alameda County itself.

Establishment of a new state college in Kern County would not have an appreciable effect upon enrollment potential at existing state col-

Table 36

Actual and Projected Rates of First-Time Freshmen to All State Colleges Per 1,000 Public High School Graduates for Selected Counties With and Without State Colleges

Counties	CEA	Actual Rates of First-Time Freshmen		Projected Rates in 1975	
		1957	1958	With No New State College	Assuming New State College
A. Counties With Existing State Colleges					
San Francisco	4f	91	97	105	...
Sacramento	5a	83	85	100	...
Santa Clara (San Jose)	8b	204	202	150	...
Fresno	9a	171	171	...	...
San Diego	14a	182	179	...	...
B. Counties Without Existing State Colleges					
Marin	4c	79	62	100	...
Contra Costa	4d	45	49	76[1]	156[4]
Alameda	4e	78	78	150	...
San Mateo	8a	109	114	144[2]	172[5]
Monterey, Santa Cruz, San Benito	8c	63	53	75	...
Kern	10	16	14	20	...
San Bernardino	13a	25	[illegible]	65[3]	150[6]

[1] Based on Department of Finance projected rates of 40 to Alameda State, 10 to San Francisco State, 10 to San Jose State, and 16 to all other state colleges.

[2] Based on Department of Finance projected rates of 30 to Alameda State, 45 to San Francisco State, 57 to San Jose State, and 12 to all other state colleges.

[3] Based on Department of Finance projected rate of 50 to California Polytechnic, Kellogg-Voorhis, and an assumed rate of 15 to all other state colleges.

[4] Assumed rate of 115 to new state colleges, 15 to Alameda, 5 each to San Francisco and San Jose, and 16 to all other state colleges.

[5] Assumed rate of 125 to new state colleges, 5 to Alameda, 15 each to San Francisco and San Jose, and 12 to all other state colleges.

[6] Assumed rate of 125 to new state colleges, 10 to California Polytechnic, Kellogg-Voorhis, and 15 to all other state colleges.

leges. Other possible new state colleges, listed in Table 34 and summarized in Table 40, are not discussed because of their relatively small enrollment potential, their distance from existing state colleges, and the probability that further study of higher education facilities in the entire state will be necessary before any commitment to these areas.

Table 40 summarizes by State Economic Areas projected 1974–75 public high school graduates in California and projected 1975 full-time enrollment at existing or authorized state colleges. In addition, the table shows estimated 1975 full-time enrollment potential for a number of possible new state colleges (from Tables 34 and 35), along with modified enrollment projections for existing state colleges which might be

Table 37

Estimated Effect Upon 1975 Enrollment Potential of San Francisco State College If New State Colleges Were Established in San Mateo and Contra Costa Counties

Counties and Areas	CEA	1974-75 Public High School Graduates	Rate of First-Time Freshmen	Estimated First-Time Freshmen		1975 Full-Time Enrollment
				Number	Per Cent	
A. With No New State Colleges in San Mateo or Contra Costa Counties						
San Francisco	4f	4,567	100	457	32.7	.....
San Mateo	8a	11,229	45	505	36.1	.....
Contra Costa	4d	6,257	10	62	4.4	.....
Alameda	4e	12,873	10	129	9.2	.....
Marin	4c	3,255	25	81	5.8	.....
All Others	...	......	...	164	11.7	.....
Total	...	......	...	1,398	100.0	8,200
B. Assuming New State Colleges in Both San Mateo and Contra Costa Counties						
San Francisco	4f	4,567	100	457	46.6	.....
San Mateo	8a	11,229	15	168	17.1	.....
Contra Costa	4d	6,257	5	31	3.2	.....
Alameda	4e	12,873	10	129	13.1	.....
Marin	4c	3,255	10	32	3.3	.....
All Others	...	......	...	164[1]	16.7	.....
Total	...	......	...	981[2]	100.0	5,754

[1] It is possible that some freshmen from "All Others" would attend new state colleges in San Mateo or Contra Costa Counties, rather than San Francisco State.

[2] Computed decrease in total first-time freshman enrollment is 417, or 29.8 per cent, of which a new state college in San Mateo County accounts for 24.1 per cent. This would presumably be the decrease in total enrollment at all class levels after a time lag.

affected by the establishment of certain new state colleges (from Tables 37–40). The State Economic Areas are listed in descending order in Table 40 in terms of their 1974–75 public high school graduates.

State totals are shown at the bottom of Table 40, based upon certain assumptions. Column 4 ("Possible New State Colleges") and Column 3 ("Existing State Colleges as Modified") are totaled (158,750 + 63,100 = 221,850) for comparison with Column 2, which shows *status quo* enrollment projections of 200,000 for existing and authorized state colleges. In view of the recommendation approved by both the State Board of Education and The Regents of the University that 3,000 be the minimum

Table 38

Estimated Effect Upon 1975 Enrollment Potential of San Jose State College If New State Colleges Were Established in San Mateo and Contra Costa Counties

Counties and Areas	CEA	1974-75 Public High School Graduates	Rate of First-Time Freshmen	Estimated First-Time Freshmen		1975 Full-Time Enrollment
				Number	Per Cent	
A. With No New State Colleges in San Mateo or Contra Costa Counties						
Santa Clara	8b	21,202	142	3,011	53.8	.....
Alameda	4e	12,873	15	193	3.4	.....
Contra Costa	4d	6,257	10	62	1.1	.....
San Mateo	8a	11,229	57	640	11.4	.....
Monterey, Santa Cruz, San Benito	8c	4,225	50	211	3.8	.....
All Others	...	......	...	1,479	26.4	.....
Total	...	......	...	5,596	100.0	24,900
B. Assuming New State Colleges in Both San Mateo and Contra Costa Counties						
Santa Clara	8b	16,262[1]	142	2,309	53.4	.....
Alameda	4e	12,873	10	129	3.0	.....
Contra Costa	4d	6,257	5	31	0.7	.....
San Mateo	8a	11,229	15	168	3.9	.....
Monterey, Santa Cruz, San Benito	8c	4,225	50	211	4.9	.....
All Others	...	......	...	1,479[2]	34.2	.....
Total	...	......	...	4,327[3]	100.0	19,248

[1] This reduction is due to the assumption that Santa Clara County high school graduates from the Palo Alto and Mountain View districts would attend a new state college in San Mateo County. The two districts comprise about 23.3 per cent of Santa Clara County high school graduates. This amounts to 4,940 high school graduates in 1974-75 (equivalent to a rate of 125 for all Santa Clara County High School graduates).

[2] It is possible that some freshmen from "All Others" would attend new state colleges in San Mateo or Contra Costa Counties, rather than San Jose State.

[3] Computed decrease in total first-time freshman enrollment is 1,269, or 22.7 per cent, of which a new state college in San Mateo County accounts for 21.0 per cent.

enrollment for the establishment of a new state college, the assumption has been made in Column 4 that only six new state colleges of those listed will be established by 1975, as follows: Inglewood, San Bernardino, Glendale, San Mateo, Contra Costa, and Kern. The assumption has also been made in Column 3 that *status quo* enrollment projections for existing and authorized state colleges will be reduced (rather than redistributed) in the following cases only, by the establishment of the six new state colleges mentioned above:

California Polytechnic College, Kellogg-Voorhis	–29%
San Francisco State College	–26%
San Jose State College	–23%
Alameda State College	–19%

Table 39

Estimated Effect Upon 1975 Enrollment Potential of Alameda State College If New State Colleges Were Established in San Mateo and Contra Costa Counties

Counties and Areas	CEA	1974–75 Public High School Graduates	Rate of First-Time Freshmen	Estimated First-Time Freshmen		1975 Full-Time Enrollment
				Number	Per Cent	
A. With No New State Colleges in San Mateo or Contra Costa Counties						
Alameda	4e	12,873	115	1,480	65.1	.....
Contra Costa	4d	6,257	40	250	11.0	.....
San Mateo	8a	11,229	30	337	14.8	.....
All Others	...	......	...	207	9.1	.....
Total	...	......	...	2,274	100.0	8,050
B. Assuming New State Colleges in Both San Mateo and Contra Costa Counties						
Alameda	4e	12,873	115	1,480	80.6	.....
Contra Costa	4d	6,257	15	94	5.1	.....
San Mateo	8a	11,229	5	56	3.0	.....
All Others	...	......	...	207	11.3	.....
Total	...	......	...	1,837[1]	100.0	6,504

[1] Computed decrease in total first-time freshmen enrollment is 437, or 19.2 per cent.

The final table in this appendix is Table 41, which gives the actual full-time enrollments for the fall of 1955, 1957 and 1958 and the *status quo* projections by levels of instruction and type of institution for the years 1960, 1965, 1970 and 1975. It is included here because it provides the basic information used in the various estimates and projections found in this appendix. Moreover it supplies the basic information on full-time enrollments used throughout this report.

Table 40

Summary by State Economic Areas of Estimated 1975 Full-Time Enrollment Potential for Possible New State Colleges with Effect Upon Existing State Colleges

State Economic Areas	1974-75 Public High School Graduates	1975 Enrollment —Existing State Colleges	Estimated 1975 Enrollment[1]	
			Existing State Colleges As Modified	Possible New State Colleges
	1	2	3	4
F. Los Angeles-Long Beach	(153,923)	(97,100)	(65,300)	(32,500)
San Fernando (12a)	30,138	18,100	9,800	12,600[2]
Central (12b) (Los Angeles State)	53,221	28,550	15,900	19,900[3]
Southern (12c) (Long Beach)	42,125	24,850	18,600	......
Eastern (12d) (California Polytechnic, Kellogg-Voorhis)	11,507	15,700	11,100	......
Orange County (12e)	16,932	9,900	9,900	......
A. San Francisco-Oakland	(39,465)	(18,750)	(15,000)	(14,700)
Alameda	12,873	8,050	6,500	......
Contra Costa	6,257	....	....	4,200
Marin (North Bay)	3,255	2,500	2,500	......
San Francisco	4,567	8,200	6,000	......
San Mateo	11,229	....	....	10,500
Solano	1,284	....	....	......
H. San Bernardino-Riverside	(22,227)	....	....	12,800
San Bernardino	14,941	....	....	......
Riverside	7,286	....	....	......
G. San Diego	22,185	20,150	20,150	......
B. San Jose (Santa Clara)	21,202	24,900	19,200	......
C. Sacramento	11,579	7,250	7,250	......
E. Fresno	5,562	8,500	8,500	......
3. South Central Coastal Area (Monterey Bay Area, San Luis Obispo)	5,473	11,050	11,050	(2,900)
K. Bakersfield (Kern)	4,304	....	....	3,100
2. North Central Coastal Area (Napa, Sonoma)	4,242	....	....	(2,100)
4. Sacramento Valley Area (Butte, etc.)	4,204	5,650	5,650	......
5. North San Joaquin Valley (Merced, Stanislaus)	3,466	2,350	2,350	......
1. North Coastal Area (Humboldt, etc.)	3,465	4,300	4,300	......
D. Stockton (San Joaquin)	2,865	....	....	(2,200)
7. South Coastal Area (Ventura)	2,825	....	....	(2,800)
6. South San Joaquin Valley (Kings, Madera, Tulare)	2,323	....	....	......
J. Santa Barbara	2,009	....	....	......
8. Imperial Valley Area	737	....	....	......
9. Sierra Area (17 Counties)	3,975	....	....	......
Total	316,031	200,000	158,750	63,100

[1] Enrollment for possible new state college shown in parentheses has not been added into the column total. [2] Glendale. [3] Inglewood.

Table 41

Summary of *Status Quo* Projections of Full-Time Enrollment in California Institutions of Higher Education by Level of Instruction and Type of Institution, to 1975

Segment and Level	Reported (Fall)			Projected (Fall)			
	1955	1957	1958	1960	1965	1970	1975
All Institutions							
All Levels	182,624	208,398	225,615	276,600	405,100	536,800	661,350
Lower division	116,573	131,104	144,080	183,100	264,450	342,000	418,250
Upper division	45,465	54,331	55,024	63,250	97,650	137,500	172,300
Graduate	18,722	20,981	22,246	25,700	37,250	50,600	63,000
Special	1,864	1,982	4,265	4,550	5,750	6,700	7,800
Public Junior Colleges							
All levels	70,165	80,916	91,162	115,750	162,600	205,200	251,400
Lower division	68,897	79,352	89,206	113,450	159,350	201,100	246,350
Special	1,268	1,564	1,956	2,300	3,250	4,100	5,050
State Colleges							
All levels	33,910	41,479	44,528	58,600	104,950	157,150	200,000
Lower division	15,596	18,019	20,052	28,000	50,350	73,350	91,750
Upper division	16,005	20,934	21,701	27,200	48,300	74,600	96,300
Graduate	2,141	2,305	2,681	3,400	6,300	9,200	11,950
Special	168	230	94	....	....	....	....
University of California							
All levels	37,717	41,625	43,101	50,400	77,000	106,050	136,000
Lower division	13,116	13,451	14,030	18,350	27,150	35,950	45,900
Upper division	14,970	16,608	16,149	17,350	27,850	39,000	50,450
Graduate	9,631	11,566	12,922	14,700	22,000	31,100	39,650
Independent Colleges							
All levels	21,625	24,630	26,801	30,950	38,550	45,400	49,900
Lower division	12,179	14,020	14,766	17,100	21,250	25,050	27,500
Upper division	7,838	9,004	9,520	10,850	13,400	15,650	17,100
Graduate	1,544	1,531	1,851	2,300	3,050	3,800	4,300
Special	64	75	664	700	850	900	1,000
Independent Universities							
All levels	19,207	19,748	20,023	20,900	22,000	23,000	24,050
Lower division	6,785	6,271	6,026	6,200	6,350	6,550	6,750
Upper division	6,652	7,785	7,654	7,850	8,100	8,250	8,450
Graduate	5,406	5,579	4,792	5,300	5,900	6,500	7,100
Special	364	113	1,551	1,550	1,650	1,700	1,750

Source: State Department of Finance.

Appendix II

ACTIONS TAKEN ON RECOMMENDATIONS IN THIS REPORT

So that the readers of this Technical Committee report may know what happened to the recommendations contained herein, that information is included in this appendix under headings *A* and *B*, as follows:

A. *Extent to Which the Master Plan Survey Team, the Liaison Committee, the State Board of Education and The Regents of the University of California Accepted the Recommendations in this Report.*

1. *Recommendations in Section III* (Utilization of Physical Plants)

   In the main, except for some minor changes in wording, these recommendations were accepted by the Master Plan Survey Team, the Liaison Committee and the governing boards. The chief change in wording as accepted by the Liaison Committee, the Master Plan Survey Team and the two governing boards, was to insert in Recommendations 1 and 2 of this section the words, "at the maximum practicable levels."

2. *Recommendations in Section IV* (Enrollment Projections and Needs for Public Junior Colleges, State Colleges, and Campuses of the University of California)

   With the exception of Recommendation 3 in this section, all the others were accepted without major modification by the Liaison Committee, the governing boards, and the Master Plan Survey Team. No action was taken by the Liaison Committee on Recommendation 3, because The Regents and the State Board of Education in joint session on April 15, 1959, voted that "The new campuses already approved for the state colleges and the University should be placed in operation as soon as the fiscal condition of the State will permit." This recommendation dealt with the Stanislaus State College which was authorized by the Legislature in 1957.

3. *Recommendations in Section* V (Faculty Demand and Supply)

   The recommendations on faculty demand and supply found in the Master Plan Report, which was approved by the Liaison Committee and the two governing boards, are identical with those found in this section.

B. *Actions taken by the 1960 Legislature on Recommendations Originating in this Report and Subsequently Accepted by the Master Plan Survey Team, the Liaison Committee and the Two Governing Boards.*

   The 1960 Special Session of the Legislature took substantive actions on recommendations which originated in this Technical Committee Report and which were subsequently approved by the Master Plan Survey Team, the Liaison Committee, The Regents of the University of California and the State Board of Education, as follows:

   1. Passed House Resolution 16, which requests the Department of Finance and the Legislative Analyst with the assistance of the Department of Education and the University of California to make a study "... of standards of utilization and occupancy of instructional areas in the state colleges and the University of California ..." and submit a report to the Legislature during the 1961 general session. (Recommendation 9a, Section III.)
   2. Approved without appropriation new state colleges:
      a. In the Los Angeles area, vicinity of the International Airport.
      b. In the San Bernardino–Riverside area. (Recommendation 4, Section IV.)
   3. Appropriated three million dollars to the University of California subject to release by the Director of Finance "... for campus planning and development including real property acquisition as may be determined by the Governor, Board of Regents and Director of Finance ..." (Recommendation 6, Section IV.)
   4. Appropriated funds for a 7½ per cent increase of academic faculty salaries in the state colleges and the University of California for the year 1960–61. (Recommendation 3, Section V.)

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